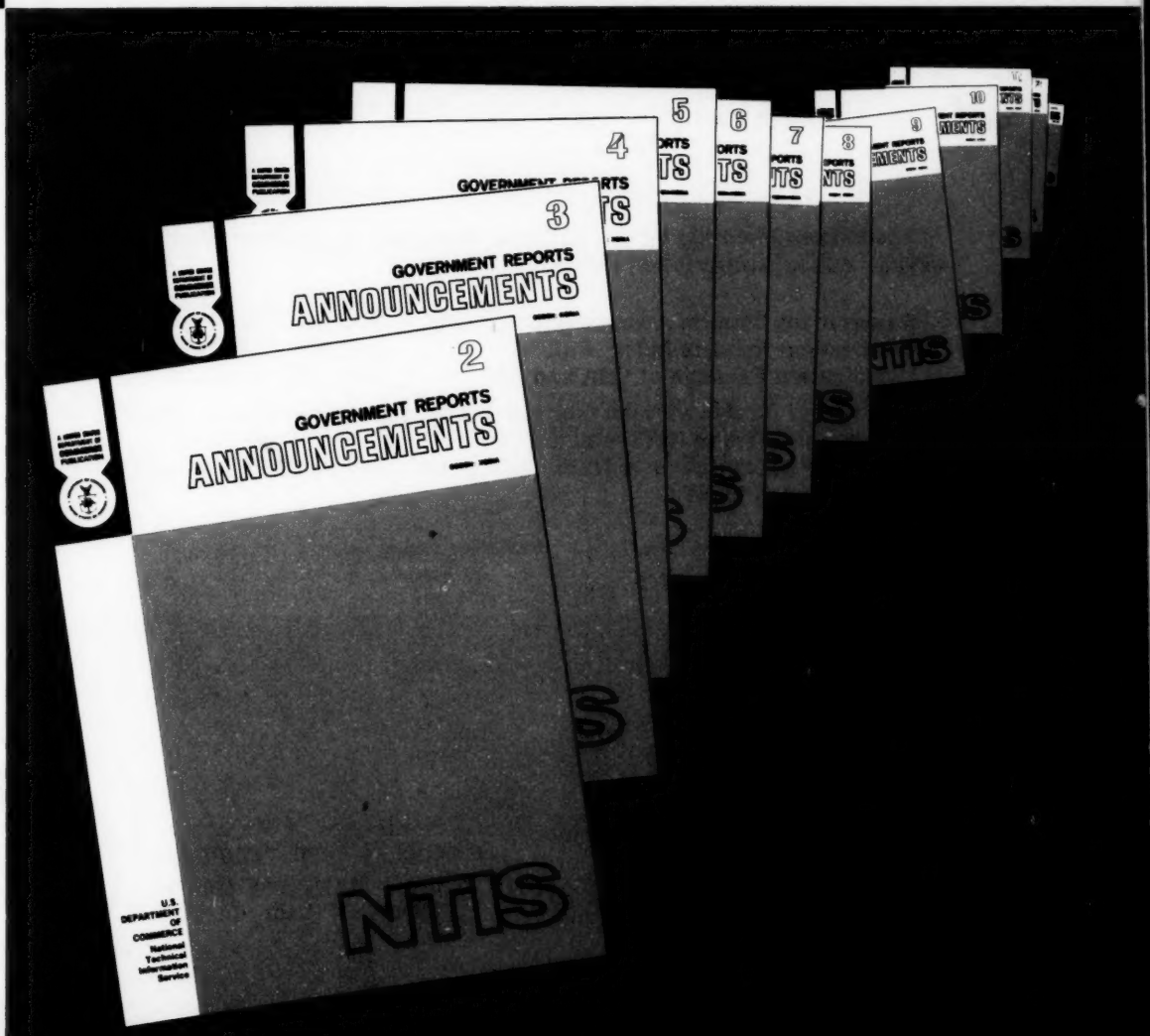
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

November 25, 1973 22

GOVERNMENT REPORTS ANNOUNCEMENTS

CODEN: GVRAA



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National Technical Information Service

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GOVERNMENT REPORTS ANNOUNCEMENTS

Volume 73, Number 22 ◆◆◆ November 25, 1973

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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

N73-27836/3GA PC$5.00/MF$1.45
Scientific Translation Service, Ann Arbor, Mich.
THE INFLUENCE OF AN INCLINED JET ON THE FLOW FIELD IN THE VICINITY OF A LIFTING SURFACE AND ON ITS AERODYNAMIC COEFFICIENTS. PART 2: LITERATURE SURVEY.
M. Seidel. Jul 73, 58p NASA-TT-F-14957, DFLR-69-3
Contract NASW-2483
Tran-Transl. Into English of "Der Einfluss Eines Geneigten Strahles Auf das Atroemungsfeld in der Umgebung Eines Leitwerks Sowie Auf Dessen Luftkraftbeiwerte. Teil 2: Literaturuebersicht", Dflr, Inst. For Aerodyn., West Germany, Report Dflr-69/3, Jan. 1969 62 p.

Descriptors: *Jet flow, *Lift devices, *Literature, *Surveys, Aerodynamic coefficients, Aerodynamic interference, Flow distribution.

For abstract, see STAR 1119

N73-27887/1GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FULL-SCALE EXPERIMENTS WITH AN EJECTOR TO REDUCE JET ENGINE EXHAUST NOISE.
B. J. Clark. Aug 73, 31p NASA-TM-X-2841, E-7445

Descriptors: *Engine noise, *Jet aircraft noise, *Jet engines, *Jet exhaust, *Noise reduction, Acoustic measurements, Acoustic properties, Sound transmission.

For abstract, see STAR 1119

N73-27888/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF NOSE SHAPE AND TAIL LENGTH ON SUPERSONIC STABILITY CHARACTERISTICS OF A PROJECTILE.
W. C. Sawyer, and I. K. Collins. Aug 73, 17p NASA-TM-X-2831, L-8995

Descriptors: *Aerodynamic configurations, *Finned bodies, *Projectiles, *Static stability, Angle of attack, Supersonic speeds, Wind tunnel stability tests.

For abstract, see STAR 1119

N73-27889/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ON THE NUMERICAL SIMULATION OF THREE-DIMENSIONAL TRANSONIC FLOW WITH APPLICATION TO THE C-141 WING.
H. Lomax, F. R. Bailey, and W. F. Ballhaus. Aug 73, 51p NASA-TN-D-6933, A-4583

Descriptors: *C-141 aircraft, *Subsonic speed, *Supercritical flow, *Wing planforms, Aerodynamic characteristics, Algorithms, Finite difference theory, Numerical analysis.

For abstract, see STAR 1119

N73-27890/5GA PC$3.00/MF$1.45
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
ANALYTICAL METHOD FOR PREDICTING THE PRESSURE DISTRIBUTION ABOUT A NACELLE AT TRANSONIC SPEEDS.
Final Report.
J. S. Keith, D. R. Ferguson, C. L. Merkle, P. H. Heck, and D. J. Lahti. Jul 73, 156p NASA-CR-2217
Contract NAS1-10804

Descriptors: *Computer programs, *Nacelles, *Pressure distribution, *Two dimensional flow, *Viscous flow, Aerodynamic characteristics, Air flow, Flow characteristics, Numerical analysis.

For abstract, see STAR 1119

N73-27891/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AERODYNAMIC CHARACTERISTICS AT MACH 0.60 TO 4.63 OF TWO CRUCIFORM MISSILE MODELS, ONE HAVING TRAPEZOIDAL WINGS WITH CANARD CONTROLS AND THE OTHER HAVING DELTA WINGS WITH TAIL CONTROLS.
W. A. Corlett, and D. T. Howell. Jul 73, 134p NASA-TM-X-2780, L-8818

Descriptors: *Aerodynamic characteristics, *Missile configurations, *Supersonic speeds, *Transonic speed, *Wind tunnel tests, Cruciform wings, Missile components, Missile control, Wind tunnel models.

For abstract, see STAR 1119

1A. Aerodynamics

AD-767 561/4GA PC$6.25/MF$1.45
General Dynamics San Diego Calif Convair Aerospace Div
STOL TACTICAL AIRCRAFT INVESTIGATION. VOLUME II. DESIGN COMPENDIUM.
Final rept. 7 Jun 71-31 Jan 73,
J. Hebert, Jr., E. S. Levinsky, J. C. Ramsey, E. C. Laudeman, and H. G. Altman. May 73, 272p Rept no. GDCA-DHG73-001-Vol-2 AFFDL-TR-73-21-Vol-2
Contract F33615-71-C-1754
See also Volume 1, AD-766 941.

Descriptors: (*Aerodynamic control surfaces, Design), (*Short take-off planes, Aerodynamic control surfaces), Jet flaps, Thrust vector control systems, Lift, Angle of attack, Drag, Leading edge, Trailing edge.

The design compendium presents methods for estimating the aerodynamic and stability and control characteristics of mechanical flaps and the three lift/propulsion systems: mechanical flaps plus vectored thrust, externally blown flaps, and internally blown flaps. A review of various theoretical approaches is presented to form a basis for the generalized methods that are developed to estimate lift, drag, pitching moment, downwash, and the lateral-directional stability derivatives. Sample problems are presented to allow the most advantageous utilization of the methodology. The data correlations shown at the end of the major sections verify and substantiate the selected approaches. A general methodology has been developed for predicting the low speed aerodynamic and stability characteristics of STOL transport aircraft. The methodology is applicable to the EBF, IBF, and MF/VT STOL concepts. The basic procedures, which predict the lift curve versus angle of attack, maximum lift coefficient, induced drag, thrust recovery, pitching moment, and downwash angle are easily hand-calculated for a single case or programmed on a small computer to calculate a large number of configurations. (Author)

N73-26990/4GA PC$3.00
National Aeronautics and Space Administration, Washington, D.C. 01a
AERONAUTICAL ENGINEERING: A SPECIAL BIBILIOGRAPHY, SUPPLEMENT 30, APRIL 1973.
Apr 73, 125p NASA-SP-7037(30)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1118

N73-26991/2GA PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A SPECIAL BIBLIOGRAPHY, SUPPLEMENT 31, MAY 1973.
May 73, 96p NASA-SP-7037(31)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1118

N73-26993/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SUPERSONIC AERODYNAMIC CHARACTERISTICS OF HYPERSONIC LOW-WAVE-DRAG ELLIPTICAL BODY-TAIL COMBINATIONS AS EFFECTED BY CHANGES IN STABILIZER CONFIGURATION.
B. Spencer, Jr., and R. H. Fournier. Jul 73, 95p NASA-TM-X-2747, L-8640

Descriptors: *Aerodynamic configurations, *Aerodynamic drag, *Horizontal tail surfaces, *Hypersonic speed, Aircraft stability, Aircraft structures, Stability derivatives, Wind tunnel tests.

For abstract, see STAR 1118

N73-26994/6GA PC$7.75/MF$1.45
National Aerospace Lab., Tokyo (Japan).
ON THE DRAG DIVERGENCE OF TWO-DIMENSIONAL AIRFOILS AT TRANSONIC SPEEDS.
N. Kamiya. Jan 73, 112p NAL-TR-299
In Japanese, English Summary.

Descriptors: *Aerodynamic drag, *Airfoils, *Transonic speed, *Two dimensional flow, Aerodynamic characteristics, Performance prediction, Pressure distribution.

For abstract, see STAR 1118

N73-26995/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF FIN PLANFORM ON THE AERODYNAMIC CHARACTERISTICS OF A WINGLESS MISSILE WITH AFT CRUCIFORM CONTROLS AT MACH 1.60, 2.36, AND 2.86.
C. D. Trescot, Jr., G. V. Foster, and C. D. Babb. Jul 73, 101p NASA-TM-X-2774, L-8783

Descriptors: *Aerodynamic characteristics, *Missile configurations, *Missile control, *Wind tunnel models, Angle of attack, Control surfaces, Fins.

For abstract, see STAR 1118

N73-26997/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AERODYNAMIC AND FLOW-VISUALIZATION STUDIES OF TWO DELTA-WING ENTRY VEHICLES AT A MACH NUMBER OF 20.3.
J. P. Arrington, and D. R. Stone. Aug 73, 72p NASA-TN-D-7282, L-8892
Misc-Technical Film Supplement L-1137 Available on Request to: Nasa. Langley Research Center, Hampton, VA. 23665 Attn: Photographic Branch, Mail Stop 171.

Descriptors: *Aerodynamic configurations, *Delta wings, *Flow visualization, *Hypersonic speed, *Space shuttles, Aerodynamic characteristics, Electron beams, Flow distribution, Helium.

For abstract, see STAR 1118

N73-27178/5GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
ON THE ACCURACY OF AERODYNAMIC PARAMETERS FOR SIMULATION.
B. Haftmann. Jul 73, 18p NASA-TT-F-14994
Contract NASW-2483
Tran-Transl. Into English from Dglr Report on the 3D Meeting of the Dglr-Symp., Flight Testing Technol., Oct. 1972 p 53-66.

Descriptors: *Aerodynamic coefficients, *Flight simulators, Errors, Graphs (Charts), Wind tunnel tests.

For abstract, see STAR 1118

N73-27206/4GA PC$4.25/MF$1.45
Aeronautical Research Inst. of Sweden, Stockholm.
PRESSURE DISTRIBUTION ON A PLANE GROUND SURFACE CAUSED BY A SUBSONIC AIRCRAFT.
B. Johansson. Dec 70, 43p FFA-AU-634-PT-2

Descriptors: *Aircraft wakes, *Ground effect, *Low altitude, *Pressure distribution, *Subsonic speed, Numerical analysis, Pressure gradients, Pressure measurements.

For abstract, see STAR 1118

N73-27207/2GA PC$16.25/MF$1.45
Hamilton Standard, Windsor Locks, Conn.
NOISE AND WAKE STRUCTURE MEASUREMENTS IN A SUBSONIC TIP SPEED FAN: TABULATION AND PLOTS OF TEST DATA.
B. Magliozzi, B. V. Johnson, D. B. Hanson, and F. B. Metzger. 23 Jul 73, 284p NASA-CR-132259
Contract NAS1-11670

Descriptors: *Acoustic measurements, *Acoustic properties, *Aerodynamic noise, *Ducted fans, *Tip speed, Noise intensity, Sound pressure, Subsonic speed, Tables (Data), Turbulent wakes.

For abstract, see STAR 1118

N73-27212/2GA PC$3.00/MF$1.45
National Aerospace Lab., Tokyo (Japan).
A NUMERICAL CALCULATION OF A TWO-DIMENSIONAL INCOMPRESSIBLE POTENTIAL FLOW AROUND A SET OF AIRFOILS APPLYING THE RELAXATION METHOD.
M. Nakamura. Jan 73, 14p NAL-TR-309
In Japanese; English Summary.

Descriptors: *Airfoils, *Flow characteristics, *Flow distribution, *Incompressible flow, *Two dimensional flow, Aerodynamic characteristics, Flow equations, Numerical analysis.

For abstract, see STAR 1118

N73-27214/8GA PC$3.00/MF$1.45
McDonnell-Douglas Corp., Long Beach, Calif.
SOME PROBLEMS OF THE CALCULATION OF THREE-DIMENSIONAL BOUNDARY LAYER FLOWS ON GENERAL CONFIGURATIONS.
T. Cebeci, K. Kaups, G. J. Mosinskis, and J. A. Rehn. Jul 73, 57p NASA-CR-2285
Contract NAS1-11623

Descriptors: *Aircraft configurations, *Space shuttles, *Three dimensional boundary layer, *Three dimensional flow, Fluid dynamics, Numerical analysis, Reynolds number, Turbulent flow.

For abstract, see STAR 1118

N73-27217/1GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
EXPERIMENTAL DETERMINATION OF BOUND VORTEX LINES AND FLOW IN THE VICINITY OF THE TRAILING EDGE OF A SLENDER DELTA WING.
D. Hummel, and G. Redeker. Aug 73, 24p NASA-TT-F-15012
Contract NASW-2481
Tran-Transl. Into English of "Experimentelle Bestimmung der Gebundenen Wirbellinien Sowie des Stroemungsverlaufs in der Umgebung der Hinterkante Eines Schlanken Deltafluegels", Braunschweigische Wissenschaftlich Gesellschaft, Abhandungen, 1972 p 273-290.

Descriptors: *Delta wings, *Flow distribution, *Trailing edges, *Turbulent boundary layer, *Vortices, Separated flow, Slender wings, Vortex generators, Wind tunnel models.

For abstract, see STAR 1118

N73-27701/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF A 1.20 PRESSURE RATIO STOL FAN STAGE AT THREE ROTOR BLADE SETTING ANGLES.
G. W. Lewis, Jr., R. D. Moore, and G. Kovich. Jul 73, 32p NASA-TM-X-2837, E-7434

Descriptors: *Axial flow, *Flow distribution, *Short takeoff aircraft, *Turbofans, *Wind tunnel models, Air flow, Numerical analysis, Performance tests, Wind tunnel tests.

For abstract, see STAR 1118

1B. Aeronautics

AD-767 489/8GA Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
THE ANALYSIS OF HUMAN FACTORS IN AIRCRAFT ACCIDENTS,
W. D. Macnamara, W. J. McArthur, and P. J. Dean. 1973, 2p
Presented at the Meeting of the Aerospace Medical Association in Miami, Fla., May 72.
Availability: Pub. in Flight Comment, p4-5 May/Jun 73.

Descriptors: (*Aviation accidents, *Human engineering), Models(Simulations), Aviation safety, Man-machine systems.

A systematic approach to the analysis of human factors in aircraft accidents was developed. That systematic approach is best described by using a model. The value of constructing a model of this type lies in its ability to present an overall picture of the analysis of human factors - a picture which shows how the components interact with one another. This model is one which attempts to consolidate and assimilate the knowledge and experience of all those people and agencies involved in aircraft accident investigation and prevention. This article is intended to communicate some of the thoughts which led to the development of the model.

AD-767 590/3GA PC$5.50/MF$1.45
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
CONTROL CONFIGURED VEHICLE RIDE CONTROL SYSTEM (CCV RCS). B-52 CONTROL SYSTEM ANALYSIS, SYNTHESIS, AND DESIGN.
Technical rept. Dec 71-31 Jan 73,
C. R. Stockdale, and R. D. Poyneer. Jul 73, 221p
Rept no. AFFDL-TR-73-83

Descriptors: (*Aerodynamic control surfaces, Design), (*Jet bombers, Turbulence), Acceleration, Flight control systems, Canard configuration, Special purpose computers, Performance(Engineering), Mathematical models.
Identifiers: B-52 aircraft, LAMS(Load Alleviation and Mode Stabilization), Load alleviation and mode stabilization, Design criteria, Ride quality, Hybrid simulation, Ride control system.

The Control Configured Vehicle Ride Control System Program was conducted to demonstrate the capability of significantly improving the ride quality of a large flexible airplane and lengthening its structural life. The ride control system employs both horizontal and vertical canards to be installed and flight tested on the B-52 LAMS vehicle. The analysis, design, and flight demonstration of the ride control system was directed toward one discrete flight condition, low level, high speed. The ride control system was designed to reduce pilot station acceleration while flying through atmospheric turbulence. (Author)

N73-27023/3GA PC$3.00/MF$1.45
Dayton Univ. Research Inst., Ohio.
EFFECT OF SHEAR ON AIRCRAFT LANDING.
Technical Report, Jul. 1971 - Nov. 1972.
J. K. Luers, and J. B. Reeves. Jul 73, 74p NASA-CR-2287
Contract NAS8-26600

Descriptors: *Aircraft landing, *Wind (Meteorology), *Wind effects, *Wind shear, Aircraft performance, Aircraft stability, Commercial aircraft, Military aircraft.

For abstract, see STAR 1118

N73-27028/2GA PC$3.25/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
COMPARISON OF SIMULATION AND FLIGHT TEST FOR AUTOMATIC STOL LANDINGS.
H. Boehret. Jul 73, 22p NASA-TT-F-14995
Contract NASW-2483
Tran-Transl. Into English from Dglr Report on the 3D Meeting of the Dglr-Symp. Flight Testing Technol. (West Germany), Oct. 1972 p 7-28 (See N73-19005 10 - 02).

Descriptors: *Aircraft landing, *Approach control, *Automatic control, *Short takeoff aircraft, Aircraft performance, Data acquisition, Flight simulation, Flight tests.

For abstract, see STAR 1118

PB-223 719/6GA PC$3.50/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
AIRCRAFT ACCIDENT REPORT. UNITED AIR LINES, INC. BOEING 737, N9031U CHICAGO-MIDWAY AIRPORT CHICAGO, ILLINOIS, DECEMBER 8, 1972.
29 Aug 73, 67p NTSB-AAR-73-16, File-1-0048
Paper copy also available Rept. no. SA-435.

Descriptors: (*Aviation accidents, *Accident investigations), Passenger aircraft, Crash landing, Instrument landing systems, Aircraft fires, Houses, Damage, Death.
Identifiers: Boeing 737 aircraft.

A United Air Lines Boeing 737-222 crashed on December 8, 1972, at 1428 c.s.t. while making a nonprecision instrument approach to Runway 31L at the Chicago-Midway Airport, Chicago, ILL. The accident occurred in a residential area approximately 1.5 miles southeast of the approach end of Runway 31L. The aircraft was destroyed by impact and subsequent fire. A number of houses and other structures in the impact area were also destroyed. There were 55 passengers and six crewmembers aboard the aircraft. Forty passengers and three crewmembers were killed. Two persons on the ground also received fatal injuries. The aircraft was observed below the overcast in a nose-high attitude and with the sound of high engine power just before it crashed into structures on the ground. The National Transportation Safety Board determines that the probable cause of this accident was the captain's failure to exercise posi-

tive flight management during the execution of a nonprecision approach, which culminated in a critical deterioration of airspeed into the stall regime where level flight could no longer be maintained.

1C. Aircraft

AD-767 058/1GA PC$15.25/MF$1.45
Rockwell International Corp Columbus Ohio Columbus Aircraft Div
FEASIBILITY STUDY OF ADVANCED FLIGHT CONTROL ACTUATION SYSTEM (AFCAS).
Final technical rept.
Jun 72, 264p Rept no. NR72H-240
Contract N62269-72-C-0108

Descriptors: (*Flight control systems, Feasibility studies), (*Jet planes, Flight control systems), Configuration, Digital computers, Hydraulic actuators, Hydraulic servomechanisms, Hydraulic accumulators, Hydraulic valves, Power supplies, Maintenance, Design.
Identifiers: Fly by wire flight control systems, Feedback control, Design criteria.

The study is directed toward establishing the feasibility of a new and innovative flight control actuation system. Analytical and some experimental data are presented such as interface considerations, trade off justifications, failure-survivability-maintainability and reliability analysis, operational and performance characteristics, weight and space considerations. In addition, a specific concept is recommended for future hardware fabrication. This concept is based on the utilization of a directly controlled surface actuator and standardized modules which can be assembled using the 'building block' approach to provide the actuator configuration and power classes. The overall actuation concept consists of three basic disciplines and they are as follows: actuator building block, power distribution, and control. (Modified author abstract)

AD-767 179/5GA PC$4.25/MF$1.45
Rockwell International Corp Los Angeles Calif Los Angeles Aircraft Div
STOL TACTICAL AIRCRAFT INVESTIGATION-EXTERNALLY BLOWN FLAP. VOLUME I. CONFIGURATION DEFINITION. SUPPLEMENT I. AERODYNAMIC TRADES OF FLAP AND ROLL CONTROL SYSTEM.
Final rept. 10 Jun 71-10 Dec 72,
Dirk J. Renselaer. Apr 73, 121p AFFDL-TR-73-20-Vol-1-Suppl-1
Contract F33615-71-C-1760
Originally pub. as Rockwell rept. no. NA-72-868-Vol-1-Suppl-1.

Descriptors: (*Aerodynamic control surfaces, Configuration), (*Short take-off planes, Performance(Engineering)), Roll, Slotted flaps, Spoilers, Boundary layer control, Ailerons, Drag, Lift.

Contents:
Comparison of climb speeds;
Comparison of roll acceleration with all engines operating;
Comparison of roll acceleration with one engine inoperative;
Comparison of lift loss due to maximum roll control.

AD-767 180/3GA PC$4.75/MF$1.45
Rockwell International Corp Los Angeles Calif Los Angeles Aircraft Div
STOL TACTICAL AIRCRAFT INVESTIGATION, EXTERNALLY BLOWN FLAP. VOLUME III. PERFORMANCE METHODS AND LANDING RULES.
Final rept. 10 Jun 71-10 Dec 72,
Dirk J. Renselaer. Apr 73, 160p AFFDL-TR-73-20-Vol-3
Contract F33615-71-C-1760
Originally pub. as Rockwell rept. no. NA-72-868-Vol-3.

Descriptors: (*Aeronautics, Short take-off planes), (*Short take-off planes, Performance(Engineering)), Aircraft landings, Take-off, Slotted flaps, Turning flight, Climbing, Sideslip, Aviation safety.

Contents:
Identification of critical STOL safety aspects;
Recommended ground rules;
STOL takeoff performance;
STOL landing performance.

AD-767 181/1GA PC$3.50/MF$1.45
Rockwell International Corp Los Angeles Calif Los Angeles Aircraft Div
STOL TACTICAL AIRCRAFT INVESTIGATION, EXTERNALLY BLOWN FLAP. VOLUME V. PART I. CONTROL SYSTEM MECHANIZATION TRADE STUDIES.
Final rept. 10 Jun 71-10 Dec 72,
Robert W. Phillips. Apr 73, 69p AFFDL-TR-73-20-Vol-5-Pt-1
Contract F33615-71-C-1760
Originally pub. as Rockwell rept. no. NA-72-868-Vol-5-Pt-1.

Descriptors: (*Flight control systems, Configuration), (*Short take-off planes, Performance(Engineering)), Adaptive control systems, Redundant components, Servomechanisms, Sensors, Failure(Electronics), Failure(Mechanics), Costs.
Identifiers: Cost comparison, Man in the loop control systems.

Contents:
System analyses;
System characteristics comparison;
Control component requirements;
Handling qualities.

AD-767 182/9GA PC$5.25/MF$1.45
Rockwell International Corp Los Angeles Calif Los Angeles Aircraft Div
STOL TACTICAL AIRCRAFT INVESTIGATION, EXTERNALLY BLOWN FLAP. VOLUME V. PART 3. STABILITY AND CONTROL DERIVATIVE ACCURACY REQUIREMENTS AND EFFECTS OF AUGMENTATION SYSTEM DESIGN.
Final rept. 10 Jun 71-10 Dec 72,
Victor H. Okumoto, and William K. Elsanker. Apr 73, 200p AFFDL-TR-73-20-Vol-5-Pt-3
Contract F33615-71-C-1760
See also report dated Apr 73, AD-767 181.
Originally pub. as Rockwell rept. no. NA-72-868-Vol-5-Pt-3.

Descriptors: (*Flight control systems, Aerodynamic characteristics), (*Short take-off planes, Performance(Engineering)), Aerodynamic characteristics, Slotted flaps, Angle of attack, Flight paths, Aeronautics, Mathematical models, Programming(Computers).
Identifiers: Digital simulation, Six degrees of freedom.

Contents:
Flying qualities requirements;
Selection o
f baseline flight condition;
Selection of coefficient variation ranges;
Technical approach;
Coefficient prediction accuracy requirements;
Lateral-directional parameter variation data;
Longitudinal parameter variation data;
Coefficient accuracy requirements -- unaugmented aircraft;
Coefficient accuracy requirements -- baseline augmented aircraft.

AD-767 203/3GA PC$3.00/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
OPTICAL FACTORS IN AIRCRAFT WINDSHIELD DESIGN AS RELATED TO PILOT VISUAL PERFORMANCE.
Final technical rept.,
Walter F. Grether. Jul 73, 36p Rept no. AMRL-TR-73-57

Descriptors: (*Windshields, *Optical properties), (*Supersonic planes, Windshields), Design, Distortion, Diffraction, Reflection, Light transmission, Pilots, Visual acuity, Jet fighters.
Identifiers: Aircraft windows, F-III aircraft.

The slope and curvature of aircraft windshields that are optimum for high speed flight cause optical degradation of pilot vision in the forward direction. The report presents a survey of the literature bearing on the conflict between aerodynamic and visual requirements. The optical effects of windshield slope (or angle of incidence) and curvature are reviewed, in terms of displacement, deviation, distortion, binocular deviation, reflections, multiple images, haze, transmission loss, and reduced resolution. Included in the review are discussions of windshield design practices in recent military aircraft, as well as optical standards and tolerance contained in current military specifications. The review also provides a discussion and research data on pilot visual performance as affected by windshield design factors, and a small sample of pilot opinions concerning the visual problems caused by the windshield of the F-111 aircraft. The report concludes with some suggestions for further studies that would assist in making choices concerning windshield design. (Author)

AD-767 234/8GA PC$3.00/MF$1.45
Air Force Academy Colo Dept of Aeronautics
VORTEX SHEDDING FROM THE RAM WING VEHICLE.
Technical progress rept. Jan-Jul 73,
Roger W. Gallington. Aug 73, 36p Rept no. DFAN-TR-73-6

Descriptors: (*Wing inlets, Vortices), (*Wing ramjet engines, Ground effect machines), Flow visualization, Drag, Skin friction, Trailing edge, Lift, Shear stresses, Low-drag airfoils, Wind tunnel models.
Identifiers: Vortex shedding, Ram wings.

Extensive flow visualization of the ram wing surface effect vehicle wake reveals the predominate feature to be a strong vortex sheet shed laterally from the lower side plate edge. This sheet quickly rolls up into a concentrated vortex which continues to move outward parallel to the surface. Neutrally buoyant helium filled bubbles are used for flow visualization supplemented by common techniques. A simple flow model, applicable to low aspect ratio ram wings with side plates, corroborates the major features of observed near wake geometry and conventional force and pressure coefficient data. Minor modifications to the geometry of the side plates are shown to cause large increases in pressure on the bottoms of the side plates. (Author)

AD-767 239/7GA PC$3.50/MF$1.45
Army Air Mobility Research and Development Lab Fort Eustis Va Eustis Directorate
GENERAL DESCRIPTION OF THE ROTORCRAFT FLIGHT SIMULATION COMPUTER PROGRAM (G-81).
Technical note,
Edward E. Austin, and William D. Vann. Jun 73, 58p USAAMRDL-TN-11

Descriptors: (*Helicopters, Simulation), Mathematical models, Aerodynamic characteristics, Stability, Rotor blades(Rotary wings), Airframes, Aerodynamic control surfaces, Programming(Computers).
Identifiers: Digital simulation, Six degrees of freedom, C-81 computer program.

The rotorcraft flight simulation is a multidisciplinary mathematical model that may be used to simulate a wide variety of helicopter or V/STOL aircraft configurations using a digital computer. Aircraft performance, stability and control, and maneuver characteristics, as well as rotor blade loads, may be estimated using this analysis. The fuselage, main rotor, tail rotor, wing, elevator, fin/rudder, jet thrust, and weapon recoil are treated as separate aircraft components, allowing detailed representation of the aircraft for design or detailed analysis applications. Six rigid-body fuselage degrees of freedom and up to six rotor blade elastic degrees of freedom for each of two rotors are accounted for. Input for the simulation is divided into logical blocks in an easy-to-understand format. The rotor blade elastic degrees of freedom are omitted if stiffness and mass properties are not known. Output includes aircraft trim attitude, control positions, performance rotor loads, stability and control characteristics, and detailed maneuver response. (Modified author abstract)

AD-767 240/5GA PC$4.50/MF$1.45
Boeing Vertol Co Philadelphia Pa
A MATHEMATICAL MODEL OF UNSTEADY AERODYNAMICS AND RADIAL FLOW FOR APPLICATION TO HELICOPTER ROTORS.
Final rept. May 71-Jul 72,
Ronald E. Gormont. May 73, 148p Rept no. D210-10492-1 USAAMRDL-TR-72-67
Contract DAAJ02-71-C-0045

Descriptors: (*Helicopter rotors, Aerodynamic characteristics), Compressible flow, Lift, Drag, Rotor blades(Rotary wings), Angle of attack, Aerodynamic loading, Mathematical models.

The report documents the development of a mathematical model which represents force coefficients acting on an airfoil in an unsteady environment. In addition, the model is extended to account for the three-dimensional effects of radial flow experienced by rotor blade sections. The methods developed in this report are aimed at obtaining improved capability for predicting rotor blade section force coefficeints, particularly at or above stall conditions. The mathematical model has been incorporated into the Government's rotorcraft flight simulation program C-81 (AGAJ71 version). The mathematical model was correlated with two-dimensional oscillating airfoil test data, and the Government's rotorcraft flight simulation program C-81 (AGAJ71 version) was correlated with full scale and model rotor test data. The results of the correlation indicate substantial improvement in rotor prediction capability at high speeds and rotor thrust coefficients above stall. (Author)

AD-767 242/1GA PC$4.50/MF$1.45
Goodyear Aerospace Corp Litchfield Park Ariz Arizona Div
DESIGN, TEST, AND ACCEPTANCE CRITERIA FOR ARMY HELICOPTER TRANSPARENT ENCLOSURES.
Final technical rept.,
Harold C. James, Allen O. Ingelse, and Richard A. Huyett. May 73, 141p Rept no. GERA-1864 USAAMRDL-TR-73-19
Contract DAAJ02-72-C-0074

Descriptors: (*Windshields, Maintainability), (*Army aircraft, *Helicopters), Design, Plastics, Laminated glass, Mechanical properties, Composite materials, Maintenance, Life expectancy, Logistics.
Identifiers: Design criteria.

The high cost of replacement of helicopter transparencies is of serious concern to the U.S. Army. A recent study of 412 windshield replacement actions revealed that the average replacement occurred every 307 flying hours. As a result of this concern, the Army contracted for a systematic study of the design, test, and acceptance criteria for helicopter transparent structures to improve the overall reliability and maintainability of these transparencies. Data were collected and analyzed; existing criteria were evaluated for effectiveness and relative importance for different classes of helicopters; and recommendations have been made for detailed design objectives, testing, and acceptance criteria. The data collection on which these recommendations were based include both objective and subjective data. Extensive interviews with operational and maintenance personnel provide a broad 'real-world' basis for evaluation of the statistical tabulations of transparency replacement actions. (Author)

AD-767 252/0GA PC$3.00/MF$1.45
Technion - Israel Inst of Tech Haifa Dept of Aeronautical Engineering
EXPERIMENTAL AND THEORETICAL ANALYSIS OF THE HEAT TRANSFER IN A CYLINDRICAL SHELL HEATED ALONG TWO OPPOSITE GENERATORS,
Joseph Frum, and Menahem Baruch. Mar 73, 49p Rept nos. TAE-177, Scientific-7
Contract F44620-71-C-0116, Grant AF-AFOSR-2394-72

Descriptors: (*Airframes, Heat transfer), (*Structural shells, Aerodynamic heating), Cylindrical bodies, Thermal stresses, Differential thermal analysis, Heat transfer coefficients, Mathematical models, Temperature, Aluminum.
Identifiers: *Cylindrical shells, Computer aided analysis.

An experimental program was conducted in order to determine the temperature profile in a cylindrical shell heated along two opposite generators. Many experimental tests were performed. Aluminum cylindrical shells were tested on a test rig designed for this case. The heating was performed by two line heaters and the temperature distribution as function of time and space was measured by a set of thermocouples located on the surface of the shell. A closed form solution for the respective heat transfer problem is given. The agreement between theory and experiments is very good. (Author)

AD-767 254/6GA PC$4.75/MF$1.45
Little (Arthur D) Inc Cambridge Mass
FAILURE ANALYSIS OF HELICOPTER EXTERNAL CARGO-HANDLING SYSTEMS.
Final rept.,
Robert E. Hunt. Jun 73, 170p Rept no. ADL-C-74645 USAAMRDL-TR-73-44
Contract DAAJ02-72-C-0063

Descriptors: (*Helicopter hoists, Failure(Mechanics)), (*Helicopters, *Cargo), Logistics, Material control, Malfunctions, Armed forces supplies, Nets, Pallets, Detents, Hooks.
Identifiers: *Failure analysis, *Logistics management, Materials handling equipment.

A study of the failure of helicopter cargo-handling systems was conducted. A data search and compilation were completed from which the external cargo-handling system was defined and the system operation explained. Operational parameters were also defined and explained. Also criteria for assessing failures were established, data sources were cited, a search plan outlined, and failure data and consensus data were retrieved and categorized. The data were taken primarily from cargo helicopters deployed in Vietnam. Their overall utilization, load categories, and rigging materials were determined, and a consensus summary of the cause of specific failures was compiled and documented. A data analysis was conducted with the relationship of failure occurrences and rates determined for specific types of accidents and failures. Predominant causes of failures were analyzed, a cost/value of relationship of cargo dropped established, and projections of the heavy-lift helicopter as a cargo carrier were made. Candidate corrective actions were recommended, with the development of specific corrective actions made, encompassing a collapsible cargo net-pallet concept and an investigation of cargo hook design principles. (Author)

AD-767 300/7GA PC$3.00/MF$1.45
General Dynamics San Diego Calif Convair Aerospace Div
STOL TACTICAL AIRCRAFT INVESTIGATION. VOLUME VI. AIR CUSHION AND GROUND MOBILITY STUDY.
Final rept. 7 Jun 71-31 Jan 73,
J. Herbert, Jr., H. Weber, G. T. Draper, C. Kerr, Jr., and T. F. Reid. May 73, 42p Rept no. GDCA-DHG73-001-Vol-6 AFFDL-TR-73-21-Vol-6
Contract F33615-71-C-1754
See also Volume 5, AD-767 364.

Descriptors: (*Short take-off planes, *Landing gear), Ground effect, Bags(Containers), Pneumatic devices, Aircraft landings, Gas turbines, Feasibility studies.
Identifiers: ACLS(Air cushion landing systems), Air cushion landing systems.

The tactical STOL transport design must consider forms of high flotation landing gear to operate effectively from unprepared fields. One configuration of particular interest is the Air Cushion Landing System (ACLS) which utilizes the ground effect principle to reduce ground overpressures. The configuration includes a rubber-nylon, torus-shaped trunk attached to the lower portion of the fuselage. Air is supplied to the trunk by turboshaft-driven fans. It is then exhausted through rows of holes along the trunk ground tangent. Aircraft weight is distributed over the cushion area providing the desired low ground pressure. After liftoff, the trunk is deflated and retracts into the side of fuselage by elastic action of the trunk material. Braking is accomplished by expanding inflatable pillows against the ground mobility and bleeding off cushion pressure. The cargo delivery/loading capability of the MST can be greatly expedited by incorporating an onboard ground mobility system in conjunction with conventional landing gear. After viewing various wheel drive systems (pneumatic, electrical, hydraulic), a mechanical drive system is presented. A gas turbine APU is mounted to the shock strut over each bogie, driving the wheels through reversing gear, clutch and shafting. (Author)

AD-767 321/3GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Crew Systems Dept
PROBLEMS OF HIGH ALTITUDE AND HIGH SPEED EJECTIONS.
Final rept.,
Thomas J. Zenobi. 30 Jul 73, 45p Rept no. NADC-73001-40

Descriptors: (*Ejection seats, High altitude), (*Aviation safety, *Naval aviation), Problem solving, Velocity, Deceleration, Wind, Military requirements, Temperature, Research program administration.
Identifiers: *High speed ejections, *High altitude ejections.

High speed ejections and high altitude ejections pose severe problems for the crewman ejection seat system. Ejection seat systems need to be upgraded to satisfy these escape conditions for new generation high performance aircraft. Windblast, deceleration, temperature extremes, stabilization, oxygen deficiency and pressure change are problems to be considered. Some of these problems are common with present ejection seats also, but they become more severe for conditions of higher speeds and higher altitudes. Development is being conducted in some of the problem areas; however, in other areas development must be undertaken to achieve the results desired by this project. (Author)

AD-767 336/1GA PC$6.25/MF$1.45
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
NOISE GENERATION BY CYLINDRICAL SPOILERS IMMERSED IN AN AIR DUCT.
Interim technical rept.,
T. M. Tower, Edelbert G. Plett, H. H. Chiu, and Martin Summerfield. Mar 73, 254p Rept no. AMS-1092
Contract N00014-67-A-0151-0029

Descriptors: (*Spoilers, *Aerodynamic noise), (*Jet engine noise, *Turbojet exhaust nozzles), (*Jet transport planes, *Turbofan engines), Commercial planes, Jet plane noise, Ducts, Vortices, Turbulence, Mathematical models, Computer programs.
Identifiers: *Noise generation, Vortex shedding.

The report describes a study concerned with the effect of thin cylindrical flow spoilers upstream of the exit plane of a constant-area duct on the acoustic power output and directivity patterns of the noise field external to the duct. Spoilers of diameter 1/16, 5/32, and 3/16 in. were placed at 1/8 in. and 11 in. from the exit plane of a 1 in. diameter duct. Far-field sound pressure levels were measured in an anechoic chamber over a mean velocity range of 250 to 900 ft/s. The frequency range of the investigation was 200 Hz to 50 kHz, while the Reynolds number range, based on mean velocity upstream of the spoiler and on spoiler diameter, was 8000 to 80,000. (Modified author abstract)

AD-767 363/5GA PC$24.00/MF$1.45
General Dynamics San Diego Calif Convair Aerospace Div
STOL TACTICAL AIRCRAFT INVESTIGATION. VOLUME IV. WIND TUNNEL DATA ANALYSIS.
Final rept. 7 Jun 71-31 Jan 73,
J. Hebert, Jr., J. C. Ramsey, E. C. Laudeman, C. A. Whitney, and N. A. Ponomareff. May 73, 440p Rept no. GDCA-DHG73-001-Vol-4 AFFDL-TR-73-21-Vol-4
Contract F33615-71-C-1754
See also Volume 3, Book 2, AD-766 943, Volume 3, Book 1, AD-766 942, and Volume 4, AD-767 364.

Descriptors: (*Short take-off planes, Performance(Engineering)), Wind tunnel models, Slotted flaps, Thrust vector control systems, Aerodynamic configurations, Trailing control surfaces, Ground effect, Aerodynamic characteristics.

Force and rake information measured during 1087 hours of low speed wind tunnel testing conducted by Convair Aerospace are summarized. Over 2730 data runs were generated on 242 major configuration variables that covered the following lift/propulsion concepts: mechanical flaps plus vectored thrust, externally blown flaps, and internally blown flaps. Lift data was reduced into three basic terms: power-on to power-off lift curve slope ratio, trailing edge flap lift increment at alpha = zero degrees, and maximum lift coefficient increment due to the application of power. These relationships were evaluated as a function of blowing momentum coefficient and correlated for the effects of configurational variations (wing planform, leading and trailing edges, and nacelle location). Drag data was reduced into the form of induced drag factor, minimum profile drag, thrust recovery and then analyzed as a function of blowing momentum coefficient. The pitching moment data analysis compares the flap pitching moment increment among the various configurations. (Modified author abstract)

AD-767 364/3GA PC$7.25/MF$1.45
General Dynamics San Diego Calif Convair Aerospace Div
STOL TACTICAL AIRCRAFT INVESTIGATION. VOLUME V. FLIGHT CONTROL TECHNOLOGY.
Final rept. 7 Jun 71-31 Jan 73,
J. Hebert, Jr., G. Campbell, E. Price, L. B. White, and R. Halstenberg. May 73, 346p Rept no. GDCA-DHG73-001-Vol-5 AFFDL-TR-73-21-Vol-5
Contract F33615-71-C-1754
See also Volume 6, AD-767 300.

Descriptors: (*Flight control systems, Configuration), (*Short take-off planes, Performance(Engineering)), Adaptive control systems, Slotted flaps, Thrust vector control systems, Aeronautics, Flight paths, Aerodynamic characteristics.
Identifiers: Digital simulation.

Flight control studies conducted during the STOL Tactical Aircraft Investigation by Convair Aerospace were directed toward development of flight control systems for three versions of the medium STOL transport. Baseline vehicles used for flight control studies were: externally blown flap, internally blown flap, and mechanical flap/vectored thrust configurations. Requirements of MIL-F-8785B and MIL-F-833000 for aircraft handling qualities were the guiding criteria for the control system study. The mechanization trade study concluded that fly-by-wire mechanization is preferred over the more mechanical version which requires significant fly-by-wire features to achieve the required augmentation and decoupling. (Modified author abstract)

AD-767 414/6GA PC$4.50/MF$1.45
Decision Science Inc San Diego Calif
INVESTIGATION OF PRINCIPLES OF CONTROL AND DISPLAY FOR RPVS.
Semi-Annual technical rept. Feb-Aug 73,
Lawrence J. Fogel, Carl E. Englund, Michael L. Mout, and Thomas D. Hertz. Aug 73, 126p Rept no. DSI-ONR-TR-73-1
Contract N00014-72-C-0196

Descriptors: (*Drones, *Flight control systems), Remote control systems, Television display systems, Flight simulators, Human engineering, Pilots, Mathematical models, Operators(Personnel), Display systems.
Identifiers: RPV(Remotely Piloted Vehicles), Remotely piloted vehicles, Analog simulation.

The purpose of this investigation was to definitize principles of display and control suitable for remotely piloted vehicles of interest to the Navy. The immediate concern is directed toward RPV strike missions wherein an aircraft will be used to deliver conventional or laser-guided weapons to highly defined targets, recover and seek further targets, then return to friendly territory. The report includes a brief discussion of the prior research conducted pertinent to this problem by Decision Science, Inc., a general research plan for the current investigation and preliminary statements regarding the first of a series of display control experiments. A bibliography is included as well as appendices which cover detailed materials used in support of this research effort.

AD-767 442/7GA Reprint
New York Univ Bronx School of Engineering and Science
ANTISYMMETRIC PROBLEMS IN SHOCK DIFFRACTION THEORY.
Interim rept.,
Max D. Gunzburger, and V. K. Yang. 16 Nov 72, 24p AFOSR-TR-73-1867
Grant AF-AFOSR-1062-67
Revision of report dated 22 Feb 72.
Availability: Pub. in the Jnl. of Applied Mathematics and Physics, v24 p83-104 1973.

Descriptors: (*Wings, Supersonic flow), (*Slender bodies, Shock waves), Flow fields, Leading edge, Conical bodies, Angle of attack, Lift, Numerical analysis.

Various aspects of the diffraction of plane shock waves by moving antisymmetric thin bodies are examined. A method is presented for removing the inhomogeneity in the shock condition. This is done without knowledge of the explicit form of the solution, and is applicable to both symmetric and antisymmetric problems. With this reduction, explicit solutions have been previously obtained for symmetric bodies. For the antisymmetric case, the problem has been previously reduced to a complicated set of integrodifferential equations. In the cases where the flow field exhibits conical properties or when the body is slender, solutions may be obtained without recourse to solving the governing integral equations. In this paper it is shown that two-dimensional conical solutions are obtainable for moving antisymmetric wings only in the restricted case of the wing Mach numbers relative to the stream ahead of and behind the shock being the same. An analytical solution is presented for the above problem. In the case of slender bodies, it is shown that the classical steady slender body theory may be extended to shock diffraction problems and again analytical solutions are presented. (Modified author abstract)

AD-767 475/7GA PC$9.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
SPECIALISTS MEETING ON HELICOPTER ROTOR LOADS PREDICTION METHODS.
Conference proceedings no. 122.
Aug 73, 152p Rept no. AGARD-CP-122
Presented at the Meeting of the Structures and Materials Panel (36th) in Milan (Italy) 30-31 Mar 73. NATO furnished.

Descriptors: (*Helicopter rotors, Aerodynamic loading), Helicopters, Design, Aeroelasticity, Fatigue(Mechanics), Vortices, Predictions, Mathematical models.
Identifiers: Computer aided analysis.

Contents:
- Rotary wing design technology;
- Current loads technology for helicopter rotors;
- Helicopter rotor loads prediction;
- Rotor system design and evaluation using a general purpose helicopter flight simulation program;
- The prediction of loading actions on high speed semi-rigid rotor helicopters;
- Load prediction methods for hingeless rotor helicopters;
- Integrated rotor/body loads prediction.

AD-767 539/8GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), CH-54A MAIN ROTOR PRIMARY SERVO.
Interim rept. 1 Jan 64-31 Dec 72.
Sep 73, 29p Rept no. USAAVSCOM-TR-73-22

Descriptors: (*Servomechanisms, *Value engineering), (*Helicopter rotors, Servomechanisms), Logistics, Quality control, Spare parts, Maintenance, Maintainability, Cost effectiveness, Malfunctions, Helicopters.
Identifiers: H-54 aircraft, CH-54A aircraft, Failure analysis, MISS(Major Item Special Studies), Major item special studies, *Logistics management.

The report describes a maintenance analysis of 2 helicopter main rotor primary servo. The report is designed to illustrate cost savings which would result from specific efforts in the areas of product improvement in quality and design, and extensions of time between overhaul of major items. For the purpose of this study the cost savings produced in the area of product improvement are based on total elimination of a certain failure mode or modes.

AD-767 540/0GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), AH-1G 90 DEGREE GEARBOX.
Interim rept. 1 Jan 64-30 Jun 72.
Sep 73, 32p Rept no. USAAVSCOM-TR-73-21

Descriptors: (*Propulsion gears, *Value engineering), (*Helicopter rotors, Propulsion gears), Logistics, Quality control, Spare parts, Maintenance, Maintainability, Cost effectiveness, Malfunctions, Helicopters.
Identifiers: MISS(Major Item Special Studies), Major item special studies, *Logistics management, Failure analysis, H-1 aircraft, AH-1G aircraft, Huey Cobra.

The report describes a maintenance analysis of a helicopter rotor gearbox. Major Item Special Study (MISS) reports are performed on DA Form 2410 reportable components. These are time change items and certain condition change items selected because of high cost or need for intensive management. Basically, the MISS reports are concerned with analyzing reported removal data presented in the Major Item Removal Frequency (MIRF) report. The failure modes reported for each removal are examined and grouped into categories which are intended to clarify the intent of the data reporting. From this data, removal distributions can be plotted and an MTR (mean time to removal) can be calculated. The MISS reports then investigate possible cost savings based on total elimination of selected failure modes. These modes are chosen because of the percentage of failures they represent and/or because they appear to be feasible Product Improvement Program (PIP) areas. (Author)

AD-767 559/8GA PC$5.75/MF$1.45
United Aircraft Corp Stratford Conn Sikorsky Aircraft Div
INVESTIGATION OF THE MANEUVERABILITY OF THE S-67 WINGED HELICOPTER.
Final rept.,
Robert A. Monteleone. Jun 73, 71p Rept no. SER-67008 USAAMRDL-TR-73-51
Contract DAAJ02-71-C-0008

Descriptors: (*Helicopters, Maneuverability), Airframes, Helicopter rotors, Wings, Aerodynamic control surfaces, Aerodynamic characteristics, Flight simulators, Flight testing.
Identifiers: S-67 aircraft, Winged helicopters, Computerized simulation.

A flight test program and a computer simulation study have been conducted to evaluate the maneuverability and speed capability of the S-67 as a representative winged helicopter design. The flight program evaluated the effects on load factor capability of wings and of variations in gross weight, center of gravity, stabilator bias angle, and type of maneuver. The computer simulation determined the effects of stabilator linkage changes, of several control system feedbacks, and of differential speed brake application for roll control. Program results show that helicopter maneuverability can be improved by the addition of wings. Main rotor control system loads were the limiting factor on maneuver capability of the S-67. Control load buildup is minimized when rotor torque is low. Wings increased speed capability somewhat by delaying rotor stall effects. The dynamic stability of the S-67 satisfies MIL-H-8501A requirements above 100 knots. (Author)

AD-767 569/7GA PC$8.00/MF$1.45
General Dynamics Fort Worth Tex Convair Aerospace Div
STUDY OF STRUCTURAL CRITERIA FOR COMPOSITE AIRFRAMES. VOLUME III - BIBLIOGRAPHY.
Final technical rept.,
Sherrell D. Manning, Glen H. Lemon, and Innes Bouton. Apr 73, 116p AFFDL-TR-73-4-Vol-3
Contract F33615-72-C-1066
See also Volume 2, AD-767 707.

Descriptors: (*Airframes, *Composite materials), (*Bibliographies, Airframes), Design, Structural properties, Reliability, Safety, Fatigue(Mechanics), Fracture(Mechanics), Loading(Mechanics), Specifications, Joints, Laminates.

The current criteria and design practices for aircraft structures are examined and evaluated for applicability to composite structures. Selected probabilistic or statistical rationales are also reviewed and evaluated for possible applications. From these studies a plan was developed for acquiring understanding and data from which structural criteria and design practices applicable to composite airframes may be written. The basic characteristics of filamentary composites which are unique when compared with metallic structure are defined and explored. Special areas investigated include laminates, joints, and cutouts. (Author)

AD-767 582/0GA PC$9.50/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
PROCEEDINGS OF THE AFCRL SCIENTIFIC BALLOON SYMPOSIUM (7TH), HELD AT PORTSMOUTH, NEW HAMPSHIRE, IN SEPTEMBER 1972.
Special repts.,
George F. Nolan. 3 Jan 73, 484p Rept nos. AFCRL-TR-73-0071, AFCRL-SR-152
See also Symposium no. 6, AD-717 149.

Descriptors: (*Balloons, *Symposia), Payload, Cables(Mechanical), Cordage, Textiles, Nonpowered flight, Flight paths, Design, Atmospheric sounding.
Identifiers: Tethered balloons.

The report contains the papers presented at the Seventh AFCRL Scientific Balloon Symposium held in September 1972. The papers were presented in three sessions: Tethered and powered balloons, balloon-borne experiments, and instrumentation and balloon technology. In the area of tethered balloons, papers were presented on cables, drag and stability characteristics, hull design and analysis, and the results of scientific experiments using tethered balloons as sensor platforms. Papers were presented on a powered spherical balloon and a survey of possible power sources for use by this system. Presentations during the balloon-borne experiments and instrumentation session included manned balloon flights, precision pointing and control platforms and instrumentation, recovery parachute performance, gondola motion analyses, a balloon radar altimeter, and an overview of French scientific ballooning activities. During the balloon technology session a review was made of the flight results and performance of balloons with volumes in excess of 20 million cubic feet, shape and stress analysis of both nonreinforced and reinforced materials, and fabric tinting to increase solar absorptivity. (Author)

AD-767 605/9GA PC$3.25/MF$1.45
Stanford Univ Calif Dept of Aeronautics and Astronautics
UNSTEADY GAS DYNAMICS PROBLEMS AND AEROELASTIC APPLICATIONS RELATED TO FLIGHT VEHICLES.
Final rept. 1 Jan 68-31 Dec 72,
Holt Ashley, and J. Michael Summa. Apr 73, 24p Rept no. SUDAAR-456 AFOSR-TR-73-1693
Contract F44620-68-C-0036

Descriptors: (*Airplane panels, Flutter), Aeroelasticity, Flutter simulators, Aerodynamic loading, Oscillation, External stores, Separation, Flow fields.

The report reviews the accomplishments made during the period of five years from 1 January 1968 through 31 December 1972 at Stanford University in a program of research on unsteady aerodynamics related to flight vehicles, and on associated aeroelastic problems. Over 20 reports have been completed during the course of the research with the purpose to improve analysis and design of high-performance aircraft. The impact on the scientific and engineering community of research done under this project has been significant and is a measure of important contributions supported by AFOSR. (Modified author abstract)

AD-767 648/9GA PC$4.50/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
STATISTICAL REVIEW OF COUNTING ACCELEROMETER DATA FOR NAVY AND MARINE FLEET AIRCRAFT FROM I JAN 1962 TO I JUL 1973.
Semi-annual summary rept.,
Thomas A. De Fiore. 1 Nov 73, 134p

Descriptors: (*Naval aircraft, Aerodynamic loading), Accelerometers, Statistical data, Fatigue(Mechanics), Predictions, Life expectancy.

The report is a specialized summary of normal acceleration data recorded by counting accelerometers. Data are separated by calendar time and mission category. Only data reported in the counting accelerometer program are included. (Author)

N73-27020/9GA PC$5.25/MF$1.45
Pratt and Whitney Aircraft, East Hartford, Conn.
STUDIES FOR DETERMINING RAPID THRUST RESPONSE REQUIREMENTS AND TECHNIQUES FOR USE IN A LONG RANGE TRANSPORT AIRCRAFT.
D. M. Newirth, and W. W. Ferguson. Aug 73, 65p
NASA-CR-121243, PWA-4693
Contract NAS3-15550

Descriptors: *Aerodynamic noise, *Propulsion system configurations, *Propulsion system performance, *Transport aircraft, Aerodynamic characteristics, Aircraft performance, Noise reduction.

For abstract, see STAR 1118

N73-27022/5GA PC$3.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. of Mechanical and Aerospace Engineering.
POINT AND PATH PERFORMANCE OF LIGHT AIRCRAFT: A REVIEW AND ANALYSIS.
F. O. Smetana, D. C. Summey, and W. D. Johnson. Jun 73, 136p NASA-CR-2272
Contract NAS1-9603

Descriptors: *Aircraft performance, *Light aircraft, *Performance prediction, *Trajectory analysis, Computer programs, Computerized simulation, Flight paths, Numerical analysis.

For abstract, see STAR 1118

N73-27026/6GA PC$3.00/MF$1.45
Boeing Co., Wichita, Kans.
STOL RIDE CONTROL FEASIBILITY STUDY.
C. K. Gordon, and R. O. Dodson. Jul 73, 103p
NASA-CR-2276, D3-9052-1
Contract NAS1-11683

Descriptors: *Aircraft performance, *Flight control, *Short takeoff aircraft, *Transport aircraft, Aerodynamic characteristics, Aircraft equipment, Passenger aircraft, Systems analysis.

For abstract, see STAR 1118

N73-28177/6GA PC$5.25/MF$1.45
Michigan State Univ., East Lansing. Div. of Engineering Research.
PRELIMINARY RESULTS FOR A LARGE ANGLE OBLIQUE JET IMPINGEMENT AND FLOW AND FOR THE EFFECT OF INITIAL CONDITIONS ON THE NEAR FIELD OF AN AXISYMMETRIC JET.
Seminannual Report.
J. F. Foss, and S. J. Kleis. 25 May 73, 61p NASA-CR-121257, SAR-3
Contract NGR-23-004-068

Descriptors: *Axisymmetric flow, *Jet aircraft noise, Autocorrelation, Boundary value problems, Flow measurement, Turbulent flow.

For abstract, see STAR 1119

N73-28883/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
EXPERIMENTS TO STUDY STRAIN GAGE LOAD CALIBRATIONS ON A WING STRUCTURE AT ELEVATED TEMPERATURES.
R. C. Monaghan, and R. A. Fields. Aug 73, 26p NASA-TN-D-7390, H-763

Descriptors: *Aerodynamic heating, *Aerodynamic loads, *Aircraft structures, *Strain gages, *Wings, Calibrating, High temperature environments, Test equipment.

For abstract, see STAR 1119

PATENT-3 677 360/GA Not available NTIS
Department of the Air Force Washington D C
HEAT REMOVAL SYSTEM FOR BRAKES.
Patent,
Kennerly H. Digges. Filed 23 Feb 71, patented 18 Jul 72, 3p Rept nos. PAT-APPL-118 011,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Brakes, *Patents), (*Ground effect machines, *Inflatable structures), Heat transfer, Condensation, Liquids, Ducts.
Identifiers: Air cushion landing systems, PAT-CL-180-124.

Air cushion landing systems have large doughnut-like structures, on the bottom of the fuselage, called trunks. The trunks form the ducting for the air cushion. According to this invention, use is made of the large quantity of air which flows through the trunks. In the present system, the air in the brake pillows is virtually static so that they form excellent insulators, which inhibit the flow of heat through the pillow to the air flowing through the trunks. The heat pump principle is used to transfer heat across the space in the braking pillows. A liquid adjacent the braking surface is evaporated and the liquid is then condensed at the wall adjacent the air flow within the trunk. The condensed liquid then flows back to the wall adjacent the braking surface.

PATENT-3 700 517/GA Not available NTIS
Office of the Secretary of the Army Washington D C
METHOD FOR ARRESTING PROPAGATING FRACTURES IN STRESSED-SKIN MONOCOQUE TYPE OF CONSTRUCTION.
Patent,
Charles D. Roach. Filed 24 Nov 70, patented 24 Oct 72, 3p Rept nos. PAT-APPL-92 443,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: (*Fibers(Synthetic), *Patents), (*Crack propagation, Control), (*Airplane panels, *Monocoques), Substrates, Glass textiles, Metal plates, Airframes.
Identifiers: PAT-CL-156-94.

The patent concerns a method for arresting fractures in stressed-skin monocoque type of construction used in aircraft. It comprises the bonding of fiber straps generally parallel to the maximum load trajectory thereby arresting the fracture when it progresses to the fiber straps.

PATENT-3 726 500/GA Not available NTIS
Department of the Navy Washington D C
LOAD-CONTROLLED DISREEFING MECHANISM FOR PARACHUTES.
Patent,
Victor G. Bockelmann. Filed 23 Aug 71, patented 10 Apr 73, 5p Rept nos. PAT-APPL-173 760,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Release mechanisms, *Patents), (*Cargo parachutes, Release mechanisms), Parachute descents, Braking, Brakes, Cordage.
Identifiers: PAT-CL-244-152.

The patent relates to a device which is provided for regulating continuously the growth rate of the diameter of parachute canopy skirt during initial inflation for the purpose of controlling drag area, drag force and opening shock. The varying degree of disreefing is accomplished automatically when the force on the parachute is below a maximum determined level enabling the parachute to be inflated safely in a minimum elapsed time.

PB-223 637/0GA PC$5.25/MF$1.45
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
MILITARY AIRCRAFT AND AIRPORT NOISE AND OPPORTUNITIES FOR REDUCTION WITHOUT INHIBITION OF MILITARY MISSIONS.
Final rept.,
Sidney J. Nethery. 27 Jul 73, 187p EPA-NTID-73.7

Descriptors: (*Military aircraft, *Aircraft noise), (*Military air facilties, Aircraft noise), Urban areas, Engine noise, Sonic boom, Land use zoning, Air pollution, Acoustic measurement, Noise reduction.
Identifiers: *Noise pollution.

The report is a result of an extensive task force effort to gather all available data pertinent to military aircraft and airport noise and opportunities for reduction without inhibition of military missions. It represents the interpretation of such data by the task group chairman responsible for this specific report.

1E. Air Facilities

AD-767 231/4GA PC$4.50/MF$1.45
Utah State Univ Logan
MODEL STUDY OF C-5A LANDINGS ON AM2 LANDING MAT.
Technical rept. 9 Jun 71-1 Feb 73,
Fred W. Kiefer, Paul T. Blotter, and Vance T. Christiansen. Aug 73, 133p AFWL-TR-72-210
Contract F29601-71-C-0129

Descriptors: (*Landing mats, *Landing impact), (*Jet transport planes, *Aircraft landings), Loading(Mechanics), Buckling(Mechanics), Failure(Mechanics), Landing gear, Aircraft tires, Model tests, Mathematical models.
Identifiers: C-5 aircraft, C-5A aircraft, AM-2 landing mats, Computer aided analysis.

After a buckling failure in a section of AM2 landing mat runway during a test landing of a C-5A at Dyess AFB, Texas, in August 1970, a model testing program was initiated. This report presents the results of the development and testing of an analytical model and a 1/7-scale physical model AM2 mat runway subjected to C-5A loadings. The analytical model represents the landing mat as a series of discrete rigid elements interconnected and suspended by springs and dashpots subjected to external forces simulating Coulomb friction, shear, and the action of the aircraft. Results from the computer program developed included a simulation of the Dyess failure and an evaluation of various mat modifications. The 1/7-scale physical model of the C-5A landing gear produced buckling failures in the model AM2 mat runway similar to the failure that occurred at Dyess AFB. (Modified author abstract)

AD-767 530/9GA PC$3.50/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
TECHNOLOGICAL FORECASTING: A CASE STUDY OF LONG-TERM REQUIREMENTS FOR RIGID AIRFIELD PAVEMENT SYSTEMS.
Technical rept.,
William J. Panunos. Aug 73, 54p Rept no. CERL-TR-A-19

Descriptors: (*Landing fields, *Pavements), Design, Management planning, Construction, Operation, Maintenance.
Identifiers: Forecasting.

The report presents the in-action example of the Delphi method of technological forcasting, which involves polling expert opinion. Experts in the planning, design, construction, and operation of airfields were polled to develop a forecast of technical capabilities in those areas. The results demonstrate how the wide range of information obtainable from expert opinion can be conveniently presented to planners. An analysis of the convergence of opinion after two rounds of questioning indicates that more than one round may be unnecessary to obtain the subjective type of information discussed in the forecast. (Author)

AD-767 600/0GA PC$4.25/MF$1.45
Southwest Research Inst San Antonio Tex
REQUIREMENTS FOR EXPLOSION-PROOF ELECTRICAL EQUIPMENT IN AIR FORCE HANGARS.
Technical rept. Jun 71-Jul 72,
Lester A. Eggleston, and Michael D. Pish. Aug 73, 125p AFWL-TR-72-135
Contract F29601-71-C-0116

Descriptors: (*Hangars, *Safety), Hazards, Aviation fuels, Jet engine fuels, Electrical equipment, Standards, Vapors, Explosions.

The objective of the research effort was to determine if current requirements for explosion-proof equipment in USAF hangars are more stringent than necessary, and thereby result in unnecessary expense in meeting such requirements. Experiments and tests conducted, both in actual USAF hangars and in the laboratory, indicated that the vapor explosibility hazard from leaks and fuel spills is lower than generally believed. The results of the study indicate that hazardous zone definitions in existing codes could be relaxed without compromising safety. (Modified author abstract)

N73-27897/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NOISE TESTS OF A MODEL ENGINE-OVER-THE-WING STOL CONFIGURATION USING A MULTIJET NOZZLE WITH DEFLECTOR.
W. A. Olsen, and R. Friedman. Aug 73, 26p NASA-TM-X-2871, E-7459

Descriptors: *Aerodynamic noise, *Deflectors, *Nozzle flow, *Short takeoff aircraft, Aerodynamic configurations, Jet flaps, Jet flow.

For abstract, see STAR 1119

N73-27898/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
LEADING EDGE SERRATIONS WHICH REDUCE THE NOISE OF LOW-SPEED ROTORS.
P. T. Soderman. Aug 73, 65p NASA-TN-D-7371, A-4074
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Moffett Field, Calif.

Descriptors: *Leading edge slats, *Noise reduction, *Rotor blades, Aerodynamic noise, Hovering, Metal strips.

For abstract, see STAR 1119

N73-27899/6GA PC$24.50/MF$1.45
Douglas Aircraft Co., Inc., Long Beach, Calif.

STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 2: AIRCRAFT.
Final Report.
Jun 73, 448p NASA-CR-114607, MDC-J4371-VOL-2
Contract NAS2-6994

Descriptors: *Aerodynamic configurations, *Air transportation, *Aircraft design, *Short haul aircraft, *Short takeoff aircraft, Aerodynamic noise, Aircraft performance, Noise reduction, Turbofan engines.

For abstract, see STAR 1119

N73-27900/2GA PC$28.25/MF$1.45
Douglas Aircraft Co., Inc., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 3: AIRPORTS.
Final Report.
Jun 73, 523p NASA-CR-114608, MDC-J4371-VOL-3
Contract NAS2-6994

Descriptors: *Airport planning, *Short haul aircraft, *Short takeoff aircraft, *Terminal facilities, Air pollution, Air traffic control, Aircraft noise, Economics, Management planning.

For abstract, see STAR 1119

N73-27901/0GA PC$16.00/MF$1.45
Douglas Aircraft Co., Inc., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 4: MARKETS.
Final Report.
Jun 73, 279p NASA-CR-114609, MDC-J4371-VOL-4
Contract NAS2-6994

Descriptors: *Air transportation, *Civil aviation, *Commercial aircraft, *Short haul aircraft, *Short takeoff aircraft, Cost effectiveness, Economics, Prediction analysis techniques.

For abstract, see STAR 1119

N73-27902/8GA PC$18.75/MF$1.45
Douglas Aircraft Co., Inc., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 5: ECONOMICS.
Final Report.
Jun 73, 333p NASA-CR-114610, MDC-J4371-VOL-5
Contract NAS2-6994

Descriptors: *Air transportation, *Economics, *Short haul aircraft, *Short takeoff aircraft, Cost effectiveness, Prediction analysis techniques, Systems analysis.

For abstract, see STAR 1119

N73-27903/6GA PC$28.75/MF$1.45
Douglas Aircraft Co., Inc., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 6: SYSTEMS ANALYSIS.
Final Report.
Jun 73, 534p NASA-CR-114611, MDC-J4371-VOL-6
Contract NAS2-6994

Descriptors: *Air transportation, *Aircraft performance, *Airline operations, *Short takeoff aircraft, *Systems analysis, *Turbofan engines, Cost effectiveness, Management planning, Operations research, Project management.

For abstract, see STAR 1119

N73-27904/4GA PC$4.25/MF$1.45
McDonnell-Douglas Corp., Long Beach, Calif.
THE RESULTS OF A LOW SPEED WIND TUNNEL TEST TO INVESTIGATE THE EFFECTS OF INSTALLING REFAN JT8D ENGINES ON THE MCDONNELL DOUGLAS DC-9-30.
H. E. Chrisenberry, P. G. Doss, A. E. Kressly, R. D. Prichard, and C. S. Thorndike. Jun 73, 41p
NASA-CR-121220, MDC-J5961
Contract NAS3-16814

Descriptors: *Aircraft configurations, *Aircraft control, *Aircraft engines, *Aircraft stability, *Dc 9 aircraft, *Pylons, *Wind tunnel models, *Wind tunnel stability tests, Aerodynamic stalling, Control surfaces, Data acquisition, Performance tests.

For abstract, see STAR 1119

N73-27905/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
EFFECTS OF FLAPS ON BUFFET CHARACTERISTICS AND WIND-ROCK ONSET OF AN F-8C AIRPLANE AT SUBSONIC AND TRANSONIC SPEEDS.
R. C. Monaghan, and E. L. Friend. Aug 73, 27p
NASA-TM-X-2873, H-742

Descriptors: *Aircraft performance, *Aircraft stability, *Buffeting, *F-8 aircraft, *Flight tests, Aerodynamic configurations, Flaps (Control surfaces), Flight characteristics, Subsonic speed, Supersonic speeds.

For abstract, see STAR 1119

N73-27907/7GA PC$8.75/MF$1.45
DESIGN INTEGRATION AND NOISE STUDIES FOR JET STOL AIRCRAFT. TASK 7A: AUGMENTOR WING CRUISE BLOWING VALVELESS SYSTEM. VOLUME 2: DESIGN EXPLORATION.
Oct 72, 131p NASA-CR-114570, D6-40829-VOL-2
Contract NAS2-6344

Descriptors: *Aerodynamic configurations, *Aircraft performance, *Lift augmentation, *Passenger aircraft, *Short takeoff aircraft, Air flow, Aircraft design, Aircraft engines, Flow characteristics.

For abstract, see STAR 1119

N73-27908/5GA PC$6.00/MF$1.45
Translation Consultants, Ltd., Arlington, Va.
EXTERNAL LOADS AND AIRCRAFT STRENGTH.
A. I. Gudkov, and P. S. Leshakov. Jul 73, 392p
NASA-TT-F-753
Contract NASW-2038
Tran-Transl. Into English of the Book "Vneshniye Nagruzki I Prochnost Letatelnykh Apparatov" Moscow, Mashinostroyeniye Press, 1968 p 1-204, 270-444.

Descriptors: *Aerodynamic loads, *Aircraft design, *Missile configurations, *Structural analysis, *Structural stability, *Wing oscillations, Applications of mathematics, Computer programs, Data processing.

For abstract, see STAR 1119

N73-27911/9GA PC$4.00/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
FURTHER DEVELOPMENT OF NOISE DATA WITH REGARD TO THE RESULTS OF AIRCRAFT NOISE INVESTIGATIONS OF THE DFG AT MUNICH ZUR WEITERENTWICKLUNG VON LAERMINDIZES UNTER BERUECKSICHTIGUNG DER ERGEBNISSE DER FLUGLAERMUNTERSUCHUNG DER DEUTSCHEN FORSCHUNGSGEMEINSCHAFT IN MUENCHEN.
K. Matschat, E. A. Mueller, and G. Zimmermann. Mar 73, 37p REPT-3/1973
Language in German.

Descriptors: *Aircraft noise, *Effective perceived noise levels, *Indexes (Ratios), *Noise intensity, Noise spectra, Noise tolerance, Normalizing (Statistics).

For abstract, see STAR 1119

2B. Agricultural Economics

PB-223 804/6GA PC$7.00/MF$1.45
Florida Univ., Gainesville. Dept. of Food and Resource Economics.
MARGINAL VALUES OF WATER USED IN THE IRRIGATION OF CITRUS IN THE CENTRAL RIDGE SECTION OF FLORIDA.
Master's thesis,
Daniel Barry Walder, III. 1972, 99p OWRR-B-007-Fla(5), W73-14760
Contract DI-14-31-0001-3267

Descriptors: (*Irrigation, *Benefit cost analysis), (*Fruit crops, Irrigation), (*Florida, Irrigation), Citrus trees, Productivity, Demand(Economics), Supply(Economics), Regression analysis, Yield, Water consumption, Theses.

The objective was to estimate the value of water used in the irrigation of citrus in the Central Ridge Section of Florida. Production functions were estimated to explain the relationship of irrigation water to citrus yields. Marginal value productivities were calculated from these estimated relationships. Two sources of data were used: yield and irrigation records for citrus plots at the Lake Alfred Agricultural Research and Education Center, and a citrus irrigation response study at Lake Alfred by R. C. J. Koo. Least-squares regression techniques were used to estimate response coefficients from yield data for the period of January, 1930, through June, 1956. The 1960-61 crop year through the 1967-68 crop year were used from the study made by Koo. Estimates of the marginal value of irrigation water per acre-inch for four selected time periods ranged from $7.23 to $148.39 for the plot data and from $6.51 to $20.64 for the study by Koo. (Modified author abstract)

2C. Agricultural Engineering

E73-10981/GA PC$3.00/MF$1.45
Purdue Research Foundation, Lafayette, Ind.
EVALUATION AND COMPARISON OF ERTS MEASUREMENTS OF MAJOR CROPS AND SOIL ASSOCIATIONS FOR SELECTED SITES IN THE CENTRAL UNITED STATES.
Bimonthly progress rept. 1 Jul-31 Aug 73,
Marion F. Baumgardner. 31 Aug 73, 6p NASA-CR-133760
Contract NAS5-21785

Descriptors: Crop identification, Soil science, Spectral reflectance, Kansas, North Dakota, Iowa, Texas, Earth resources program, Land use, Rangelands.

The author has identified the following significant results. An unsupervised classification was run for an area around Tahoka Lake, Texas. Classes from the unsupervised were correlated with the available ground observations. Unsupervised classes which corresponded to major rangeland composition groups were used as a basis for a classification of most of Lynn County. Three classes of pasture were identified: (1) clear pasture, mostly grasses; (2) mixture of grasses and mesquite; and (3) areas of thick mesquite. In addition, one class called 'other' included lakes and agricultural areas. It was found that differences in rangeland composition could be mapped from spectral data using computer-aided processing techniques. The T Bar

Ranch, which surrounds the Double Lakes west of Tahoka, Texas, was chosen as a test area for the classification of rangeland. It was found that the classification was reasonably consistant with the low altitude oblique air photos.

PB-223 539/8GA PC$3.00/MF$1.45
Minnesota Univ., Minneapolis. Water Resources Research Center.
CHARACTERISTICS OF THE SOIL MATRIX THAT AFFECT WATER STORAGE AND MOVEMENT.
Project completion rept. 1 Jan 69-30 Jun 73,
George R. Blake. Aug 73, 40p* W73-14467,
OWRR-B-015-Minn(8)
Contract DI-14-01-0001-1916

Descriptors: (*Soil structure, Investigations), Soil aggregates, Soil water, Percolation, Evaporation, Hydraulic conductivity, Soil chemistry, Research projects, Soybean plants.

The objectives of the research project were to investigate: Water storage and release from the soil as related to the matrix characteristics; and reactions occurring between water, clay and quartz during initiation, growth and stabilization of domains in the soil matrix that affect the storage and movement of water. It was shown in careful laboratory measurements that soil matric suction increased with time in pulverized, moistened, pressed soil sealed to prevent water loss. Water stability also increased with time for simulated aggregates formed by extrusion under pressure. Time-dependent suction and stability increases suggest spontaneous shift from face-face to edgeface orientation of clay in the matrix. An interesting field application that increased the soil moisture storage reservoir was established on two sandy soil types where moisture deficiency is the principal yield-limiting factor. Treatment consisted of plowing in a nearly continuous, hot sprayed asphalt barrier 55 cm deep in two replicated experiments. Various vegetable crops were grown.

2D. Agronomy and Horticulture

COM-73-11520/6GA PC$3.75/MF$1.45
National Weather Service, Clemson, S.C.
PROBABILITY OF PEACH TREE DORMANCY DURING THE WINTER IN SOUTH CAROLINA,
Alex J. Kish, John C. Purvis, and Roy J. Ferree.
Apr 73, 33p NOAA-73080906
Also pub. as South Carolina Agricultural Experiment Station, Clemson, Agricultural Weather Research Ser-36.

Descriptors: (*Peach trees, Dormancy), (*Climate, Peach trees), Weather, Seasonal variations, Atmospheric temperature, Exposure, Plant growth, South Carolina.
Identifiers: Chilling hour.

The publication summarizes the average chilling hours observed in South Carolina so that peach growers may take full advantage of the statistics. 'Chilling hour' is defined as one hour when the ambient temperature is at or below 45F. In the last 25 years plant breeders have had chilling requirements as one of the desired characteristics in the new seedlings resulting from a cross. Because of this fact, peaches are now being grown where they have never been successfully grown before. The new varieties recommended for an area are those with a chilling hour requirement compatible with its climate and elevation.

COO-3217-18/GA PC$6.25/MF$1.45
Inter-American Inst. Of Agricultural Sciences, Turrialba (Costa Rica).
APPLICATION OF NUCLEAR ENERGY TO AGRICULTURE. ANNUAL REPORT.
C. C. Moh. 1 Apr 73, 82p
Contract AT(11-1)-3217

Descriptors: (*Plants, *Mutations), (*Phaseolus, Mutations), (*Coffee plants, Mutations), Biological radiation effects, Fungi, Gamma radiation, Bacillus, Infectivity, Beans, Beta particles, Density, Seeds, Ceratitis capitata, Fertility, Moths, Pest control, Pupae, Radiosterilization, Sterile male technique, Sterilization, Survival time, Ultraviolet radiation, Photon beams, Plant stems, Pollen, Radioinduction.

For abstract, see NSA 28 02, number 02858.

JPRS-59927/GA PC$3.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
SOIL TEMPERATURE AND PLANTS IN THE NORTH,
A. I. Korovin. 30 Aug 73, 64p
Trans. of mono. Temperatury Pochvy I Rastenie na Severe, Petrozavodsk, 1961 Chapt. 5, 6, and conclusion.

Descriptors: (*Soils, Plant growth), (*Agriculture, USSR), Cold stress, Temperature, Agronomy, Horticulture, Translations.
Identifiers: Soil temperature, Cold regions.

The report contains data on the effect of decreased soil temperature on fruiting of plants and on alleviating the negative effect of decreased soil temperatures on plants under conditions of the north.

NP-19717/GA PC$5.50/MF$1.45
Cekmece Nuclear Research and Training Center, Istanbul (Turkey).
VARIATION AND COMPARISON OF THE SUBCELLULAR LOCALIZATION OF ZINC IN DIVERSE BROAD BEAN VICIA FABA TISSUES OF INCREASING DEVELOPMENTAL STAGES.
E. Polar. 1972, 67p
U.S. Sales Only.

Descriptors: (*Plant tissues, *Radionuclide kinetics), (*Zinc, *Uptake), Age dependence, Amino acids, Leaves, Plant stems, Proteins, Roots, Trace amounts, Tracer techniques, Vicia, Zinc 65.

For abstract, see NSA 28 02, number 02984.

ORO-2410-24/GA PC$4.25/MF$1.45
North Carolina State Univ., Raleigh. Dept. Of Soil Science.
NITRATE ABSORPTION AND STRONTIUM ACCUMULATION. ANNUAL PROGRESS REPORT, 1 AUGUST 1972--31 JULY 1973.
W. A. Jackson. Apr 73, 43p
Contract AT(40-1)-24

Descriptors: (*Nitrates, *Root absorption), (*Strontium, *Uptake), Amino acids, Calcium, Calcium 45, Cations, Inhibition, Labelled compounds, Nitrogen 15, Reduction, Roots, Strontium 85, Tungsten ions, Water, Wheat.

For abstract, see NSA 28 02, number 05053.

ORO-2410-25/GA PC$3.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. Of Soil Science.
NITRATE ABSORPTION AND STRONTIUM ACCUMULATION. SUMMARY REPORT, 1 MAY 1971--31 JULY 1973.
W. A. Jackson. Apr 73, 8p
Contract AT(40-1)-2410

Descriptors: (*Nitrates, *Root absorption), (*Strontium, *Buildup), Ammonium compounds, Calcium, Cations, Labelled compounds, Nitrogen 15, Nitrous acid, Plants, Proteins, Uptake.

For abstract, see NSA 28 02, number 05054.

PB-223 570/3GA PC$3.50/MF$1.45
American Horticultural Society, Mount Vernon, Va.
TRANSIT PLANTING: A MANUAL.
Final rept.
Jul 73, 67p* UMTA-VA-06-0006-73-1
Contract DOT-UT-619

Descriptors: (*Highways, *Landscaping), (*Plants(Botany), *Horticulture), Manuals, Ornamental plants, Shrubs, Trees(Plants), Cultivation, Urban planning, Ecology.

The purpose of the report is to develop a manual for the horticultural development of public transportation environments and urban landscaping. Various landscapes are introduced in which all-season plants would be a prime contributor to the design. There is also a guide which would enable transit planners anywhere in the nation to make a better selection of planting materials for their particular region so that materials once chosen would provide an assurance of successful and economical maintenance. Judgments on the suitability of specific plants in specific environments are based on ecological adaptability, taking into account such factors as climate, the plant's ability to resist pollution, and the amount of care required to maintain the specific plant. Besides an analysis of national zones, and alphabetical lists of plants according to scientific and common names, specific applications are discussed in relation to bus stops, suburban terminals and downtown stations. Trees are analyzed according to size, growth rate, shape, features such as shade, flowers or ornamental value, possibilities of training to a large shrub, and types of soil required. Also discussed in a like vein are shrubs, ground covers and interior plants.

RT/BIO-(72)17/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
DURUM WHEAT MUTANTS IN PERFORMANCE FIELDS OF MARCHE.
C. Mosconi. 16 Sep 70, 16p CONF-700458-1
In Italian. U.S. Sales Only.

Descriptors: (*Mutants, *Plant breeding), Wheat.

For abstract, see NSA 28 03, number 07774.

2E. Animal Husbandry

AD-767 399/9GA PC$2.75/MF$1.45
Texas A and M Univ College Station Dept of Veterinary Microbiology
JET INJECTION IN LARGE ANIMAL MEDICINE, JET INJECTOR EVALUATION.
Rept. no. 8 (Annual), 1 Jun 72-31 May 73,
S. McConnell, H. W. Whitford, and L. C. Grumbles. 1 Jul 73, 16p
Contract DADA17-71-C-1087

Descriptors: (*Injection(Medicine), *Veterinary medicine), (*Medical equipment, Injection(Medicine)), Animals, Vaccines, Aquatic animals, Birds.
Identifiers: *Jet injector guns(Medicine).

In depth evaluation of the jet injector for use in large animal medicine was made. The study encompassed both the physical and biological properties of the jet injector gun. As presently engineered, the gun is entirely satisfactory for use in a number of different species of animals, both food and companion, including equine, bovine, caprine, ovine and porcine, certain changes in the combination of nozzle, orifice diameter, intensifier and spring size are required depending on the species under study. These optimal combinations have been detailed in the body of the report. (Modified author abstract)

COO-910-29/GA PC$3.50/MF$1.45
Minnesota Univ., St. Paul. Coll. Of Veterinary Medicine.

BOVINE LYMPHOCYTIC LEUKEMIA: STUDIES OF ETIOLOGY, PATHOGENESIS, AND MODE OF TRANSMISSION. PROGRESS REPORT, JULY 1972--JULY 1973.
D. K. Sorensen. 30 Apr 73, 26p
Contract AT(11-1)-910

Descriptors: (*Cattle, *Leukemogenesis), Leukemia, Lymphatic system, Pathogenesis, Viruses.

For abstract, see NSA 28 03, number 07694.

TT-69-53053/GA PC$4.75/MF$1.45
Agricultural Research Service, Washington, D.C.
SELECTED ARTICLES ON FODDER CROPS,
V. A. Rogov, P. Sh. Uzilevskaya, and A. I. Granitov. 1973, 156p
Trans. of Nauchno-Issledovatelskii Institut Zhivotnovodstva. Trudy (USSR) v7 p3-17, 27-31, 159-230 1962. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Feeding stuffs, USSR), Translations, Animal nutrition, Farm crops, Plants(Botany), Minerals, Livestock, Breeding.

Contents:
- Preliminary data on testing of perennial fodder crops on sanzar experimental sheepbreeding base in 1960;
- Preliminary data on testing of annual fodder plants in sanzar collection nursery;
- Content of microelements-cobalt, copper, iodine, manganese and iron--in certain fodders of Uzbekistan;
- Study of fodder crops on dry lands.

2F. Forestry

E73-11017/GA PC$3.75/MF$1.45
Minnesota Univ., St. Paul. Inst. of Agriculture. Color Sensing Lab.
ERTS-1 DATA APPLICATIONS TO MINNESOTA FOREST LAND USE CLASSIFICATION.
Annual progress rept.,
Joseph E. Sizer, Ralph G. Eller, Merle P. Meyer, and Joseph J. Ulliman. 1 Jul 73, 35p IARSL-73-2
NASA-CR-133813
Contract NAS5-21801
Prepared in cooperation with the Minnesota State Planning Agency.
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198. ERTS.

Descriptors: Minnesota, Land use, Forest management, Earth resources program, Management information systems, Land management, Timber, Identification.

The author has identified the following significant results. Color-combined ERTS-1 MSS spectral slices were analyzed to determine the maximum (repeatable) level of meaningful forest resource classification data visually attainable by skilled forest photointerpreters for the following purposes: (1) periodic updating of the Minnesota Land Management Information System (MLMIS) statewide computerized land use data bank, and (2) to provide first-stage forest resources survey data for large area forest land management planning. Controlled tests were made of two forest classification schemes by experienced professional foresters with special photointerpretation training and experience. The test results indicate it is possible to discriminate the MLMIS forest class from the MLMIS nonforest classes, but that it is not possible, under average circumstances, to further stratify the forest classification into species components with any degree of reliability with ERTS-1 imagery. An on-going test of the resulting classification scheme involves the interpretation, and mapping, of the south half of Itasca County, Minnesota, with ERTS-1 imagery. This map is undergoing field checking by on the ground field cooperators, whose evaluation will be completed in the fall of 1973.

PB-223 464/9GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
FACTORS AFFECTING THE PRODUCTIVITY OF LOGGING CREWS USING CHAIN SAWS AND WHEELED SKIDDERS IN TREE-LENGTH ASPEN.
Forest Service research note (Final),
Dennis P. Bradley, and Frank E. Biltonen. Aug 73, 5p FSRN-NC-151

Descriptors: (*Forest trees, Lumbering), (*Lumbering, *Minnesota), Wooden logs, Pulpwood, Saws, Production, Volume, Equipment.

The report describes the productivity of selected aspen pulpwood loggers in northern Minnesota. The most important factors affecting productivity were the ratio of harvested trees per acre to total trees per acre, harvested volume per acre, and the spacing of nonharvested trees.

PB-223 514/1GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
ESTIMATING SLASH FUEL LOADING FOR SEVERAL LAKE STATES TREE SPECIES.
Forest Service research paper (Final),
Peter J. Roussopoulos, and Von J. Johnson. Jun 73, 13p FSRP-NC-88

Descriptors: (*Forest fires, Research), (*Vegetation, Surveys), Estimates, Wood wastes, Measurement, Fire hazards, Fire control, Fire prevention, Forests.

In order to assess the slash fuel in cutover areas, a planar intersect sampling method is described and two alignment charts provided for estimating foliage and branchwood weight in tons per acre. Development of the alignment charts is also described.

PB-223 531/5GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
BALSAM FIR DOMINANT SPECIES UNDER RETHINNED NORTHERN WHITE-CEDAR.
Forest Service research note (Final),
William F. Johnston. Feb 72, 5p FSRN-NC-133

Descriptors: (*Forest trees, Plant reproduction), (*Wisconsin, Forest trees), Cutting, Plant growth.
Identifiers: Abies balsamea, Thuja occidentalis.

A 20-year thinning study in a Wisconsin swamp stand of middle-aged northern white-cedar indicates that advance tree reproduction and shrubs grow little until after a second thinning to less than 150 square feet of basal area per acre. Balsam fir will probably dominate this undergrowth, particularly if the area is used heavily by snowshoe hare or white-tailed deer. (Author)

PB-223 549/7GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
SOME SOIL PHASES IN THE MISSOURI OZARKS HAVE SIMILAR SITE INDEXES FOR OAKS.
Forest Service research paper (Final),
Richard F. Watt, and Michael E. Newhouse. Apr 73, 10p FSRP-NC-86

Descriptors: (*Oak trees, Soil physics), (*Missouri, Oak trees), Plant growth, Sites, Soil horizons, Age, Soil properties.
Identifiers: Quercus alba, Quercus velutina.

Site index was determined on 179 black oak and 125 white oak plots in fully stocked, even-aged oak-hickory stands in southeastern Missouri. Equal numbers of plots were selected on the basis of aspect, slope position, and slope steepness for each soil phase for both pan and nonpan soils. Soil profiles were described and samples taken. Results showed that site indexes cannot be predicted from soil phases. Site index was not related to the presence or absence of a fragipan. (Author)

PB-223 550/5GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
KANSAS SAW-LOG PRODUCTION JUMPS 38 PERCENT FROM 1964 TO 1969.
Forest Service research note (Final),
James E. Blyth, and Leonard K. Gould. Dec 71, 3p FSRN-NC-128

Descriptors: (*Wood products, Production), (*Kansas, Wood products), Volume, Lumbering, Sawmills.
Identifiers: Cottonwood.

About 23 million board feet of saw logs were harvested in Kansas during 1969. Volumewise, cottonwood, walnut, and elm were the most important species. Most of the wood residue generated at the 57 Kansas sawmills was not used. (Author)

PB-223 552/1GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
CROWN RELEASE INCREASES DIAMETER GROWTH AND BOLE SPROUTING OF POLE-SIZE YELLOW BIRCH.
Forest Service research note (Final),
Gayne G. Erdmann, and Ralph M. Peterson, Jr. Jan 72, 5p FSRN-NC-130

Descriptors: (*Birch trees, Plant growth), Cutting, Quality, Hardwoods.
Identifiers: Betula alleghaniensis.

During the second and third years after release, dominant, codominant, and intermediate pole-size yellow birch grew nearly twice as fast in diameter as unreleased poles. Growth rates were also related to foliage density. Epicormic sprouting was increased by crown release but most sprouting occurred in the second log. (Author)

PB-223 574/5GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
AN IMPROVED GROWTH INTERCEPT METHOD FOR ESTIMATING SITE INDEX OF RED PINE.
Forest Service research paper (Final),
David H. Alban. Aug 72, 12p FSRP-NC-80

Descriptors: (*Pine trees, Plant growth), Indexes(Ratios), Soil fertility, Estimates, Minnesota.
Identifiers: Pinus resinosa.

Equations for predicting red pine (Pinus resinosa Ait.) site index from various internode lengths were developed from ring counts on sectioned trees from 69 natural stands in Minnesota. The precision of estimating site index was much improved by measuring the five-year growth intercept beginning at 8 feet above ground rather than at the conventional breast height. The growth intercept equation developed from natural stands in Minnesota is shown to be applicable to red pine plantations in Minnesota, New York, and Connecticut.

PB-223 586/9GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
SELECTING SEED SOURCES OF FOREST TREES FOR THE LAKE STATES--AN INTERIM GUIDE.
Forest Service research note (Final),

James P. King, and David H. Dawson. Oct 71, 5p
FSRN-NC-108

Descriptors: (*Pine trees, Seeds), (*Seeds, Selection), Forest trees, Plant genetics, Recommendations, Wisconsin, Minnesota, Michigan.

Choosing the best seed source can be just as important economically as choosing the proper species for tree planting programs. The report summarizes the best seed sources for major species currently used in planting programs in Wisconsin, Minnesota, and Michigan. Recommendations are provided for red pine, jack pine, white pine, Scotch pine, white and Norway Spruce, and black walnut. (Author)

PB-223 650/3GA PC$3.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
WISCONSIN'S 1968 TIMBER RESOURCES. A PERSPECTIVE.
Forest Service research bull. (Final),
John S. Spencer, Jr., and Harry W. Thorne. Dec 72, 89p FSRB-NC-15

Descriptors: (*Forest land, *Wisconsin), (*Forestry, Inventories), Forest trees, Structural timber, Volume, Plant growth, Mortality, Predictions, Utilization.

The third inventory of Wisconsin's timber resource shows substantial gains in growing-stock and sawtimber volumes since 1956, in spite of a small decline in area of commercial forest land. Presented are text and statistics on forest area and timber volume, growth, mortality, ownership, stocking, and use in 1968. Two 30-year projections of timber growth, removals, and inventory are also presented--one assuming a high level of future timber removals and the other a low level.

TT-71-51008/GA PC$2.75/MF$1.45
Forest Service, Washington, D.C.
OXYGEN CONTENT IN PEAT WATER (SODERZHANIE KISLORODA V VODE TORFYANYKH POCHV),
B. V. Babikov. 1973, 5p
Trans. of Lesnoe Khozyaistvo (USSR) n2 p22 1967. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Peat, *Soil water), (*Dissolved gases, Soil water), Ground water, Oxygen, Swamps, Plant growth, Translations, USSR.

The report briefly discusses the levels of dissolved oxygen in sphagnum peat ground water and its effect on the growth of pine trees.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

N73-27725/3GA PC$5.25/MF$1.45
Sydney Observatory (Australia).
ASTROGRAPHIC CATALOGUE, 1900-0: SYDNEY SECTION DEC. -51 DEG TO -65 DEG, VOLUME 53.
1971, 64p

Descriptors: *Astronomical catalogs, *Astronomical photography, *Australia, Astronomical coordinates, Reference stars.

For abstract, see STAR 1118

N73-28494/5GA PC$11.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LST PHASE A DESIGN UPDATE STUDY.
1 Aug 73, 182p NASA-TM-X-64763

Descriptors: *Astronomical telescopes, *Spaceborne telescopes, High resolution, Scientific satellites, Space maintenance, Space shuttle orbiters, Systems engineering.

For abstract, see STAR 1119

3B. Astrophysics

AD-767 050/8GA PC$3.50/MF$1.45
California Univ Riverside Inst of Geophysics and Planetary Physics
JUPITER'S RADIATION BELTS.
Technical rept.,
Kent G. Stansberry, and R. Stephen White. Jun 73, 58p Rept nos. IGPP-UCR-73-23, TR-10
Contracts N00014-69-A-0200-5001, N00014-69-A-0200-5004
Sponsored in part by Grant NGR-05-008-022.

Descriptors: (*Jupiter(Planet), *Planetary atmospheres), Electrons, Protons, Transport properties, Extraterrestrial radio waves, Diffusion, Mathematical models.
Identifiers: Synchrotron radiation, Flux density.

Fluxes of electrons and protons in Jupiter's radiation belts are calculated with the source, radial diffusion inward from the solar wind, and the loss, synchrotron radiation. The calculations are tested against the measured radiowave wavelength distribution, the radiowave distribution with distance from Jupiter and the degree of polarization of the radiowaves. The Fokker-Planck equation is solved using the method of Farley and Walt with the flux fixed at the outer boundary and zero flux at Jupiter's surface. It was found in agreement with Brice and McDonough, Jacques and Davis, and Birmingham et al. that the usual magnetic and electric diffusions, that vary as L sup 10 and L sup 6, respectively, are insufficient to furnish the required electrons and that the diffusion driven by ionospheric winds of Brice and McDonough is strong enough to furnish Jupiter's belts. (Modified author abstract)

AD-767 215/7GA PC$2.75/MF$1.45
Weather Squadron (12th) Ent AFB Colo
A REVIEW OF NEUTRAL LINE ANALYSIS TECHNIQUES.
1 Jun 73, 12p Rept no. Technical Paper-73-9

Descriptors: (*Solar atmosphere, Magnetic fields), Sunspots, Solar disturbances, Reviews.
Identifiers: Solar magnetic fields.

There are five basic H-Alpha structures that can be used for inferring neutral lines: filaments, filaments channels, arch filaments, plage corridors, and fibrils. They may be used singularly or in a combined form. This review briefly describes each of these five structures. Procedures (McIntosh) for inferring neutral lines are also discussed. (Author)

AD-767 308/9GA PC$4.25/MF$1.45
Naval Research Lab Washington D C
CALCULATIONS OF EXPECTED PROTON FLUENCES FOR A FLYBY OF JUPITER.
Final rept.,
James W. Butler. Sep 73, 108p Rept no. NRL-MR-2651

Descriptors: (*Jupiter(Planet), Space environmental conditions), (*Space probes, Radiation damage), Protons, Power spectra, Semiconductor devices, Tables, Computer programs.
Identifiers: Extraterrestrial radiation, Radiation belts.

The Naval Research Laboratory was requested to study the problem of radiation survivability for the Jupiter-Saturn spacecraft beginning with the 1976 launch. This report describes in some detail one phase of the survivability project: calculations of proton fluence spectra that might be expected from Jupiter's trapped radiation on the basis of the best trapped radiation models currently available.

AD-767 367/6GA PC$3.00/MF$1.45
Owens Valley Radio Observatory Pasadena Calif
A SEARCH FOR OD IN THE GALACTIC CENTER,
Diego A. Cesarsky, Richard M. Crutcher, and Mark Allen. 1973, 9p Rept no. 1973-14
Contract N00014-67-A-0094-0019
Also available as Arthur Amos Noyes Lab. of Chemical Physics rept. no. Contrib-4747.

Descriptors: (*Gallaxies, Interstellar matter), (*Interstellar matter, *Free radicals), Deuterated compounds, Extraterrestrial radio waves, Radio astronomy.
Identifiers: *Galactic center, Hydroxyl radical.

The authors have unsuccessfully searched for the delta F = 0 lambda doublet transitions of the doublet Pi(3/2), J = 32 state of the OD. The resulting upper limit of the OD/OH column density ratio is 1/400. (Modified author abstract)

COM-73-11415/9GA Reprint
National Oceanic and Atmospheric Administration, Princeton, N.J. Geophysical Fluid Dynamics Lab.
DYNAMICS OF A CONVECTIVELY UNSTABLE ATMOSPHERE: JUPITER,
Gareth P. Williams, and John B. Robinson. 21 Dec 72, 37p NOAA-73081709
Revision of report dated 12 May 72.
Pub. in Jnl. of the Atmospheric Sciences, v30 n4 p684-717 May 73.

Descriptors: (*Jupiter(Planet), *Planetary atmospheres), Atmospheric circulation, Convection.
Identifiers: *Jupiter atmosphere.

The authors test the hypothesis that the atmospheric circulations of Jupiter are a manifestation of large-scale convective instability brought about primarily by the presence of an internal heat source. This is done by examining the nature of convection in an unstable rotating atmosphere through numerical integration of the Boussinesq equations. The general properties of convection are obtained from solutions with laboratory-scale parameters while particular Jovian characteristics are studied through calculations with planetary-scale parameters. The solutions indicate that a tropical westerly jet can be produced by an axisymmetric flow provided that the atmosphere is relatively shallow. A strong equatorial westerly flow can occur provided that there is a strong diffusion of the tropical jet. The strength of such a diffusion is of a magnitude that suggests that it can only realistically be brought about by large-scale nonaxisymmetric disturbances. Differential rotation suppresses the organization of large-scale convective motion poleward of 45 degrees while toward the equator such motions can set in strongly. (Modified author abstract)

COM-73-11424/1GA PC$5.50/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
INTERPLANETARY SHOCK WAVES GENERATED BY SOLAR FLARES,
Murray Dryer. 1971, 67p NOAA-73080933
Presented at IUGG (15th) General Assembly, Moscow, 2-14 Aug 71.

Descriptors: (*Solar flares, Shock waves), Plasma physics, Aerospace environment, Solar wind, Mathematical models.
Identifiers: Interplanetary magnetic fields.

Recent experimental and theoretical studies of interplanetary shock waves are reviewed. The distinction between blast-originated and piston-driven shocks is clearly made with respect to inferred trajectories and consistent with previous studies. Information from space probes can be used to infer the trajectories of both forms of shock waves. Substantial deceleration of blast waves, as suggested by Venera and Pioneer space-probe measurements, leads to speculation regarding the mechanism responsible for the energy

degradation of the shock waves. The special case of the constant velocity, piston-driven double-shock ensemble is examined with the use of similarity theory. The results (which take the interplanetary magnetic field into account) are compared with an ensemble observed by Heos-1. Gross characteristics of such shock ensembles -- such as deposition of energy released in the flare and overall structure -- are predicted by the time-dependent fluid theory. However, detailed flow parameters involve processes which probably require finer-grained plasma physics analyses rather than the continuum fluid treatment. Finally, a suggested list of outstanding problems in the study of interplanetary shock propagation is outlined. (Author)

JPRS-59963/GA PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
DATA ON ILLUMINATION IN THE ATMOSPHERE AND ON THE SURFACE OF VENUS OBTAINED BY THE AUTOMATIC INTERPLANETARY STATION VENERA-8,
V.S. Avduevskii, M. Ya. Marov, B. E. Moshkin, and A. P. Ekonomov. 5 Sep 73, 7p
Trans. of Akademiya Nauk SSSR. Doklady, v210 n4 p799-802 1973.

Descriptors: (*Venus(Plant), Illuminance), (*Venus atmosphere, Illuminance), Surface properties, Venus probes, USSR, Translations.
Identifiers: Venera 8 spacecraft.

The report contains results of direct measurements of illumination in the atmosphere and on the surface of the planet Venus during the flight of the automatic interplanetary station Venera-8.

JPRS-59985/GA PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
RADIOASTRONOMY,
A. G. Sokolov, A. A. Parshchikov, A. N. Korzhavin, L. D. Bakhrakh, and N. A. Esenkina. 7 Sep 73, 47p
Trans. of Izvestiya Vysshikh Uchebnykh Zavadenii Radiofizika (USSR) v16 n5 p655-675, 703-711 1973.

Descriptors: (*Radio telescopes, USSR), Radio astronomy, Antennas, Antenna radiation patterns, Polarization, Performance evaluation, Alignment, Fabrication, Translations.

Contents:
- A System for Automating Observations on the RTI-7.50/250 MVTU Radiotelescope;
- The Development of Structural Methods for Increasing the Effectiveness of Fully Rotatable Parabolic Antennas;
- Optical Modeling of the Radiation Pattern of a Variable Profile Antenna Operating in the Hartman Diaphragm Mode;
- Method of Alignment and Technology of Fabricating RTI-7.5/250 MVTU Radiotelescope Antennas;
- Parameters of the RT-22 KrAO Radiotelescope Antenna at Wavelengths of 3 and 1.35 Centimeters;
- Determination of the Polarization Characteristics of the Large Pulkovo Radiotelescope;
- Optical Accumulation Time in Superlong-Baseline Interferometers.

N-72-33768/GA PC$4.00/MF$1.45
Texas Univ., Dallas.
MEASUREMENT OF THE DEGREE OF ANISOTROPY OF THE COSMIC RADIATION USING THE IMP SPACE VEHICLE. FINAL TECHNICAL REPORT.
R. A. R. Palmeira, and F. R. Allum. Oct 72, 31p NASA-CR-130090

Descriptors: (*Cosmic radiation, *Anisotropy), (*Electrons, Cosmic radiation), (*Protons, Cosmic radiation), (*X radiation, Cosmic radiation), Angular distribution, Energy spectra, Explorer satellites, Radiation detectors, Solar radiation.

For abstract, see NSA 28 02, number 03543.

N-73-10824/GA PC$4.00/MF$1.45
Lockheed Missiles and Space CO., Palo Alto, Calif.
PECULIAR O6F STAR HD 148937 AND THE SYMMETRICALLY SURROUNDING NEBULAE.
H. M. Johnson. 1972, 13p NASA-CR-128404
Contract NASW-1977

Descriptors: (*Stars, *Ultraviolet spectra), (*Nebulae, Ultraviolet spectra), Photometry, Planetary nebulae, Radiowave radiation, Temperature dependence.

For abstract, see NSA 28 03, number 06555.

N-73-10852/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
VLBI OBSERVATIONS OF THE CRAB NEBULA PULSAR.
N. R. Vandenberg, T. A. Clark, W. C. Erickson, G. M. Resch, and J. J. Broderick. Oct 72, 16p NASA-TM-X-66071, X-693-72-381

Descriptors: (*Pulsars, *Size), Crab nebula, Interferometry, Mhz range 100-1000, Polarization, Resolution.

For abstract, see NSA 28 02, number 03616.

N-73-11814/GA PC$4.00/MF$1.45
Aerospace Corp., El Segundo, Calif. Space Physics Lab.
SOLAR FLARE PREDICTIONS AND WARNINGS. FINAL REPORT.
K. P. III White. 1 Oct 72, 40p NASA-CR-114511, ATR-73(7265)-1
Contract NAS2-6654

Descriptors: (*Solar flares, *Monitoring), Accuracy, Distribution, Radiowave radiation, Sunspots.

For abstract, see NSA 28 03, number 06593.

N-73-11815/GA PC$4.00/MF$1.45
Aerospace Corp., El Segundo, Calif. Space Physics Lab.
SOLAR FLARE FORECASTS BASED ON MM-WAVELENGTH MEASUREMENTS.
K. P. III White. 25 Oct 72, 40p NASA-CR-114510, ATR-73(8102)-4

Descriptors: (*Solar flares, *Radiowave radiation), Emission, Maps, Plages, Sunspots, Temperature dependence.

For abstract, see NSA 28 03, number 06594.

N-73-12872/GA PC$7.60/MF$1.45
National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
STUDY OF HEAVY TRANS-IRON PRIMARY COSMIC RAYS (Z MORE THAN OR EQUAL TO 55) WITH A FAST FILM CHERENKOV DETECTOR.
L. S. Pinsky. Nov 72, 232p NASA-TM-X-58102, MSC-7561

Descriptors: (*Intermediate mass nuclei, Primary cosmic radiation), (*Primary cosmic radiation, *Origin), Abundance, Iron, Mass, Nucleosynthesis, Quantity ratio, Supernovae.

For abstract, see NSA 28 02, number 03544.

N-73-12893/GA PC$4.00/MF$1.45
California Inst. Of Tech., Pasadena.
RELATIVISTIC STELLAR STABILITY: AN EMPIRICAL APPROACH.
W. T. Ni. 1972, 33p NASA-CR-129241

Descriptors: (*Stars, *Stability), General relativity theory, Gravitation, Neutron stars, Solar system, White dwarf stars.

For abstract, see NSA 28 03, number 06611.

NP-19727/GA PC$6.00/MF$1.45
Oslo Univ. (Norway). Institutt for Teoretisk Astrofysikk.
ISOTOPIC COMPOSITION OF SOME METALS IN THE SUN.
Oe. Hauge. 1972, 76p
U.S. Sales Only.

Descriptors: (*Sun, *Chemical composition), (*Rubidium, *Abundance), (*Strontium, Abundance), (*Antimony, Abundance), Copper, Doppler effect, Europium, Hyperfine structure, Isotope ratio, Metals, Photosphere, Silicon, Solar atmosphere, Spectra, Spectral shift, Sunspots.

For abstract, see NSA 28 02, number 03633.

NP-19728/GA PC$3.75/MF$1.45
Oslo Univ. (Norway). Institutt for Teoretisk Astrofysikk.
APPARENT CONNECTION BETWEEN SPACE VELOCITY AND ROTATIONAL VELOCITY IN EARLY TYPE STARS.
O. Havnes. 1971, 32p
U.S. Sales Only.

Descriptors: (*Stars, *Rotation), Binary stars, Luminosity, Motion, Star clusters, Velocity.

For abstract, see NSA 28 03, number 06556.

NP-19732/GA PC$3.00/MF$1.45
Oslo Univ. (Norway). Institutt for Teoretisk Astrofysikk.
CORRECTION OF OBSERVED PENUMBRAL INTENSITIES FOR SCATTERED LIGHT.
P. Maltby, and L. Staveland. 1972, 13p
U.S. Sales Only.

Descriptors: (*Sunspots, *Visible radiation), (*Photosphere, Visible radiation), Scattering.

For abstract, see NSA 28 03, number 06595.

NP-19735/GA PC$3.75/MF$1.45
Oslo Univ. (Norway). Institutt for Teoretisk Astrofysikk.
CORRECTION OF SOLAR INTENSITY MEASUREMENTS FOR STRAY LIGHT.
L. Staveland. 1972, 35p
U.S. Sales Only.

Descriptors: (*Sunspots, *Visible radiation), Accuracy, Background radiation, Photosphere, Sun, Zones.

For abstract, see NSA 28 03, number 06596.

NP-19745/GA PC$4.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
PULSAR RADIO EMISSION MECHANISM.
J. Virtamo, and P. Jauho. (1971)7 37p
U.S. Sales Only.

Descriptors: (*Pulsars, *Radiowave radiation), Acceleration, Bremsstrahlung, Electric fields, Electrons, Emission, Magnetic fields.

For abstract, see NSA 28 03, number 06584.

N73-27312/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MARS: MARINER 9 SPECTROSCOPIC EVIDENCE FOR H2O ICE CLOUDS.
R. J. Curran, B. J. Conrath, R. A. Hanel, V. G. Kunde, and J. C. Rearl. Jun 73, 14p NASA-TM-X-66289, X-651-73-156
Subm-Submitted for Publication.

Descriptors: *Cloud glaciation, *Mariner 9 space probe, *Mars atmosphere, Absorption cross sections, Infrared spectrometers, Numerical analysis, Particle size distribution, Scattering cross sections.

For abstract, see STAR 1118

N73-27679/2GA PC$13.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Earth and Planetary Sciences.
A STUDY OF LUNAR MODELS BASED ON APOLLO AND OTHER DATA.
Annual Report, 1 Mar. 1972 - 28 Feb. 1973.
Jan 73, 220p NASA-CR-133302
Contract NGL-22-009-187

Descriptors: *Apollo project, *Selenology, *Statistical analysis, Electrical properties, Lunar rocks, Magnetic properties, Molecular orbitals.

For abstract, see STAR 1118

N73-27719/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PIONEER SOLAR PLASMA AND MAGNETIFIC FIELD MEASUREMENTS IN INTERPLANETARY SPACE DURING 2-17 AUGUST 1972.
J. D. Mihalov, D. S. Colburn, B. F. Smith, C. P. Sonett, and J. H. Wolfe. May 73, 17p NASA-TM-X-62291

Descriptors: *Magnetic fields, *Magnetic measurement, *Pioneer 10 space probe, *Pioneer 9 space probe, *Solar wind, Cosmic plasma, Interplanetary magnetic fields, Solar magnetic field, Solar protons.

For abstract, see STAR 1118

N73-27720/4GA PC$5.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SPATIAL DISTRIBUTION OF SOFT X-RAY AND EUV EMISSION ASSOCIATED WITH A CHROMOSPHERIC FLARE OF IMPORTANCE 1B ON 2 AUGUST 1972.
W. M. Neupert, R. J. Thomas, and R. D. Chapman. Jul 73, 56p NASA-TM-X-66299, X-682-73-10

Descriptors: *Cosmic rays, *Spatial distribution, *X ray spectroscopy, Electron energy, H alpha line, Solar flares.

For abstract, see STAR 1118

N73-27721/2GA PC$4.75/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
ANALYSIS OF SOLAR X-RAY DATA.
L. W. Acton, and W. T. Zaumen. May 73, 51p NASA-CR-133341
Contract NASW-2316

Descriptors: *Iron, *Line spectra, *Solar flares, *Solar x-rays, Plasma decay, Solar activity, Spectral line width.

For abstract, see STAR 1118

N73-27726/1GA PC$3.00/MF$1.45
University Research Foundation, San Diego, Calif.
ASTEROID AND COMET EXPLORATION.
G. Arrhenius, H. Alfven, and R. Fitzgerald. Jul 73, 58p NASA-CR-2291
Contract NAS8-27929
Subm-Prepared in Cooperation with Calif. Univ., San Diego.

Descriptors: *Planetary evolution, *Solar system, *Space exploration, Asteroids, Comets.

For abstract, see STAR 1118

N73-27728/7GA PC$9.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GALACTIC BACKGROUND MAPS AT 3.93 AND 6.55 MHZ.
M.S. Thesis - Maryland Univ.
J. C. Novaco. Jun 73, 147p NASA-TM-X-66280, X-693-73-182

Descriptors: *Galactic radiation, *Radio astronomy explorer satellite, *Tables (Data), Antenna radiation patterns, Background radiation, Data smoothing.

For abstract, see STAR 1118

N73-27735/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ARE THE RECENTLY OBSERVED SOFT GAMMA-RAY BURSTS FROM STELLAR SUPER FLARES .
F. W. Stecker, and K. J. Frost. Jul 63, 6p NASA-TM-X-66294, X-641-73-217
Subm-Submitted for Publication.

Descriptors: *Flares, *Gamma rays, *Stellar radiation, Bremsstrahlung, Electrons, X rays.

For abstract, see STAR 1118

N73-27736/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PIONEER-10 MEASUREMENTS OF THE DIFFERENTIAL AND INTEGRAL COSMIC-RAY GRADIENT BETWEEN 1 AND 3 AU.
B. J. Teegarden, F. B. Mcdonald, J. H. Trainor, E. C. Roelof, and W. R. Webber. Jul 73, 16p NASA-TM-X-66293, X-661-73-201
Subm-Submitted for Publication.

Descriptors: *Cosmic rays, *Pioneer 10 space probe, *Radiation measurement, Helium, Nuclei (Nuclear physics), Proton flux density.

For abstract, see STAR 1118

N73-27739/4GA PC$3.00/MF$1.45
California Univ., La Jolla. Dept. of Physics.
INFRARED SPECTROMETER INVESTIGATIONS OF THE PLANETS AND PLANETARY SATELLITES.
Final Technical Report.
E. C. Gillett. 26 Jun 73, 5p NASA-CR-133413
Contract NGR-05-009-142

Descriptors: *Astronomical spectroscopy, *Filter wheel infrared spectrometers, Astronomical telescopes, Microwave filters, Planetary nebulae.

For abstract, see STAR 1118

N73-28498/6GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DETERMINATION OF THE GEOMETRICAL FACTOR AND OF THE SPATIAL DISTRIBUTIONS OF PARTICLES FOR A COSMIC RAY TELESCOPE USING A MONTE CARLO APPROACH.
M. Hemmer, and C. J. Crannell. Jul 73, 44p NASA-TM-X-70428, X-661-73-218
Contract NGR-09-050-001
Subm-Prepared in Cooperation with Federal City Coll.

Descriptors: *Angular distribution, *Computer programs, *Monte carlo method, Fortran, Spatial distribution, Subroutines.

For abstract, see STAR 1119

N73-28753/4GA PC$24.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INTERNATIONAL SYMPOSIUM AND WORKSHOP ON GAMMA-RAY ASTROPHYSICS.
Invited Papers.
F. W. Stecker, and J. I. Trombka. Jun 73, 447p NASA-TM-X-66279, X-641-73-180
Conf-Held at Greenbelt, MD., 30 Apr. - 2 May 1973.

Descriptors: *Annihilation reactions, *Conferences, *Evolution (Development), *Gamma rays, *Universe, Antimatter, Astrophysics, Cosmic rays, Diffuse radiation, Radiation sources, X rays.

For abstract, see STAR 1119

N73-28772/4GA PC$33.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HIGH ENERGY PHENOMENA ON THE SUN, SYMPOSIUM PROCEEDINGS.
R. Ramaty, and R. G. Stone. May 73, 632p NASA-TM-X-66290, X-693-73-193
Conf-Symp. Held at Greenbelt, MD., 28-30 Sept. 1972.

Descriptors: *Conferences, *High energy interactions, *Solar flares, *Solar physics, *Solar radio bursts, Solar corona, Solar electrons, Solar magnetic field, Solar protons, Solar spectra, Solar x-rays.

For abstract, see STAR 1119

N73-28824/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ANALYSES OF THE GAMMA-RAY PULSE-HEIGHT SPECTRA FROM THE LUNAR SURFACE.
J. I. Trombka. Jun 73, 20p NASA-TM-X-70421, X-641-73-167

Descriptors: *Gamma rays, *Lunar crust, *Lunar radiation, *Spectrum analysis, Compton effect, Lunar composition, Pair production, Pulse amplitude.

For abstract, see STAR 1119

N73-28825/0GA PC$6.00/MF$1.45
Scripta Technica, Inc., Washington, D.C.
THE MEASUREMENT OF RADIATION IN SPACE.
Y. I. Galperin, L. S. Gorn, and B. I. Khazanov. Jul 73, 333p NASA-TT-F-754
Contract NASW-2484
Tran-Transl. Into English of "Izmereniye Radiatsii V Kosmose" Moscow, Atom Press, 1972 344 p.

Descriptors: *Cosmic rays, *Ionizing radiation, *Radiation measurement, Charged particles, Electrons, Neutrons, Radiation counters, Radiation measuring instruments.

For abstract, see STAR 1119

N73-28826/8GA PC$7.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

THE LARGE SCALE STRUCTURE OF THE SOLAR WIND.
J. H. Wolfe. Mar 71, 100p NASA-TM-X-69342
Conf-Presented at the Solar Wind Conf., Pacific Grove, Calif., 21-26 Mar. 1971.

Descriptors: *Solar activity effects, *Solar wind, Interplanetary medium, Proton energy, Solar cycles, Solar instruments.

For abstract, see STAR 1119

N73-28843/3GA PC$3.25/MF$1.45
Techtran Corp., Silver Spring, Md.
RHYTHMS ON THE EARTH AND IN SPACE, CHAPTER 9.
Y. V. Maksimov. Jul 73, 21p NASA-TT-F-14985
Contract NASW-2485
Tran-Transl. Into English from the Book "Problemy Oledeniya Zemli I Ritmy V Prirode" Leningrad, Nauka, 1972 p 250-268.

Descriptors: *Aerospace environments, *Earth (Planet), *Geophysics, *Periodic variations, Bibliographies, Statistical analysis, Tectonics.

For abstract, see STAR 1119

N73-28851/6GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind.
ZR PARTITIONING AND KINETICS AND MECHANISM.
Final Progress Report.
L. A. Taylor. 22 Mar 73, 9p NASA-CR-133333
Contract NGR-15-005-175

Descriptors: *Lunar rocks, *Research and development, Cooling, Mineralogy, Zirconium.

For abstract, see STAR 1119

N73-28853/2GA PC$3.00/MF$1.45
Harvard Univ., Cambridge, Mass. Hoffman Lab.
MELTING BEHAVIOR AND PHASE RELATIONS IN THE LUNAR INTERIOR.
Final Report, 1 May 1970 - 30 Apr. 1973.
J. F. Hays. 30 Jun 73, 12p
Contract NGR-22-007-175

Descriptors: *Lunar geology, *Lunar topography, *Petrography, Lunar composition, Lunar rocks, Research and development.

For abstract, see STAR 1119

N73-28857/3GA PC$4.75/MF$1.45
Mons Univ. (Belgium). Dept. d'Astrophysique.
ECLIPTIC COORDINATES OF SELECTED HOT STARS.
L. Houziaux, and A. Ringuelet. 1972, 53p
COMMUN-27

Descriptors: *Astronomical catalogs, *Ecliptic, *Hot stars, *Lists, Astronomical coordinates, Stellar luminosity, Tables (Data).

For abstract, see STAR 1119

N73-28858/1GA PC$3.00/MF$1.45
Mons Univ. (Belgium).
FINDING LIST FOR BAYER AND FLAMSTEED STARS IN THE 'ECLIPTIC COORDINATES OF SELECTED HOT STARS' CATALOGUE.
G. Houziaux. 1972, 12p COMMUN-31

Descriptors: *Astronomical catalogs, *Hot stars, *Longitude, Astronomical coordinates, Constellations, Ecliptic, Stellar luminosity, Tables (Data).

For abstract, see STAR 1119

UCRL-74669(Rev.1)/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
INFLUENCE OF SCREENING EFFECTS ON CARBON IGNITION.
H. C. Jr. Graboske. 29 Mar 73, 14p CONF-730415-2

Descriptors: (*Stars, *Thermonuclear reactions), (*Carbon, Thermonuclear reactions), Density, Emission, Energy, Neutrinos, Oxygen, Temperature dependence.

For abstract, see NSA 28 03, number 06557.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-767 063/1GA PC$5.50/MF$1.45
Colorado State Univ Fort Collins Fluid Dynamics and Diffusion Lab
STRATIFIED SHEAR FLOWS OVER A SIMULATED THREE-DIMENSIONAL URBAN HEAT ISLAND.
Technical rept.,
S. SethuRaman, and J. E. Cermak. Aug 73, 208p
Rept nos. CER73-74SSJEC4, THEMIS-CER-TR-23
Contract N00014-68-A-0493-0001

Descriptors: (*Atmospheric motion, Three-dimensional flow), (*Air pollution, Atmospheric motion), Urban areas, Atmospheric temperature, Distribution functions, Curve fitting, Graphics.
Identifiers: Themis project, Turbulent flow, *Urban heat islands, Wind velocity.

Three-dimensional airflow over a rectangular heat island was studied for various conditions of approach flow in a wind tunnel. Three different thermal stratifications of the approach flow were selected for the study-neutral, ground based and elevated inversions. For each of these flows studies were conducted with and without roughness over the heat island and for the conditions with and without heating. Approach flow temperature profiles were modeled according to atmospheric data available in the literature. For each of the twelve cases mentioned above, measurements of mean wind velocity, longitudinal velocity fluctuations, mean temperature and temperature fluctuations were made. In addition, mean concentration measurements of a radio-active gas released from a two-dimensional, ground-level line source upwind of the heat island were made. Flow patterns were visualized for different cases with the help of a passive smoke source. Comparisons of data from the wind-tunnel measurements with the field data were made. The mechanisms of the heat island observed in the wind-tunnel for different stratified flows were very similar to those observed in the field. The urban heat island plume that passes aloft downwind causes an appreciable reverse flow onto the heat-island. The helical vortices at the edge of the heat island cause a reduction in the turbulence level resulting in high concentrations of the mass released from a continuous line source upwind of the heat island. (Modified author abstract)

AD-767 077/1GA PC$5.50/MF$1.45
Systems Control Inc Palo Alto Calif
ATMOSPHERIC MODEL SURVEY.
Final rept. 1 Feb-31 Aug 73,
R. B. Schainker, J. E. Wirsching, R. W. Lau, J. W. Patmore, and R. P. Brennan. Aug 73, 221p Rept no. SCI-5101-1
Contract N00014-73-C-0409

Descriptors: (*Atmosphere models, *Stratosphere), (*Jet transport planes, *Climatology), Air pollution, Photochemistry, Atmospheric motion, Wake, Aerosols, Water vapor, Transport properties, Analysis of variance, Mathematical models, Statistical distributions, Regression analysis, Time series analysis, Monte Carlo method, Solar radiation, Ozone.
Identifiers: Climatic impact assessment program, Climatic changes, Supersonic transports, Environmental surveys, Atmospheric circulation, Atmospheric composition, CIAP(Climatic Impact Assessment Program).

The report treats the subject of error variance analysis as an adjunct to the scientific content of the final reports and monographs of the Climatic Impact Assessment Program (CIAP). A survey of CIAP modelling efforts is presented and assembled in array format to illustrate the composite linkage of atmosperic mechanisms. (Author)

AD-767 115/9GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
SEA WAVE ORIGIN OF MICROBAROMS AND MICROSEISMS,
William L. Donn, and Bhoopal Naini. 12 Mar 73, 10p Rept no. LDGO-1981 AROD-6997:30-EN
Grant DA-ARO-D-31-124-71-G90
Also pub. as City Univ. of New York. Inst. of Oceanography. Contrib-19. Revision of report dated 28 Jul 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n21 p4482-4488, 20 Jul 73.

Descriptors: (*Microbarometric waves, Ocean waves), (*Microseisms, Ocean waves), Storms, Sources, Power spectra, Correlation techniques.
Identifiers: *Air water interactions, Ocean surface.

Microbaroms and microseisms have nearly identical frequencies and a common direction of approach, viz., from the same ocean storms. This finding is indicative of a common generating source for both microbaroms and microseisms. The only mechanism that appears capable of transmitting energy into both the atmosphere and the sea bottom is associated with the surface waves in a storm area. (Author)

AD-767 185/2GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
ROCKET INVESTIGATIONS OF THE VLF IONOSPHERIC TRANSMISSION WINDOW.
Environmental research papers,
Richard B. Harvey, Robert P. Harrison, Vollie C. Fields, George C. Hirst, and Paul A. Kossey. 7 May 73, 34p Rept nos. AFCRL-ERP-445, AFCRL-TR-73-0293

Descriptors: (*Ionospheric propagation, Very low frequency), Radio transmission, Atmospheric sounding, Mathematical models, Whistlers.

Receivers were flown in rockets from Eglin Air Force Base, Florida, Natal, Brazil, and Fort Churchill, Canada, to study the fields of very low frequency (VLF) waves propagating in the earth-ionosphere waveguide, and leaking through the ionosphere to altitudes of 500-600 km. Amplitude-height, group delay, and polarization profiles are given for signals from a number of ground based transmitters. A coherent propagation model is proposed and partially tested by calculating Doppler shifts. The model, extended with a full-wave computer program, allows wave-field profiles to be approximated theoretically. The extent to which some sample calculations agree with the observations is discussed. (Author)

AD-767 251/2GA PC$3.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
MILLSTONE HILL THOMSON SCATTER RESULTS FOR 1968.
Technical rept.,
John V. Evans. 23 Jan 73, 88p Rept no. TR-499 ESD-TR-73-55
Contract F19628-73-C-0002

Descriptors: (*Atmospheric sounding, Ionosphere), Electron density, Diurnal variations, Atmospheric temperature, Radar reflections.
Identifiers: F region, Electron energy.

The report summarizes the results for the electron density distribution, electron and ion temperatures in the F-region obtained during 1968 using the Millstone Hill Thomson (incoherent) scatter radar system. These data, for the height interval approximately 200 to 800 km, were gathered over 24-hour observing periods, roughly twice per calendar month. The time required to obtain a complete electron density and temperature profile over this height interval was usually 30 minutes. During 1968 the apparatus employed to measure the frequency spectrum of the reflected signals vs altitude, which in turn yields the estimates of the electron and ion temperatures, was rebuilt permitting the measurements at all altitudes to be made in real time, and with greater accuracy than heretofore. In addition, the new spectrum analyzer permitted the first measurements at millstone Hill of the vertical drift of the plasma. The density and temperature results show that the separate clear patterns of summer and winter diurnal behavior, recognized at sunspot minimum, can still be discerned at sunspot maximum on all but very disturbed days. (Modified author abstract)

AD-767 303/1GA PC$3.50/MF$1.45
Ghana Univ Legon Dept of Physics
IONOSPHERIC RESEARCH USING SATELLITES - THE EQUATORIAL FARADAY EVENING MINIMUM.
Interim scientific rept. 1 Jan-31 Dec 72,
John R. Koster. 1 Feb 73, 63p AFCRL-TR-73-0546
Grant AF-AFOSR-2258-72

Descriptors: (*Ionospheric disturbances, Ionization), (*Ionospheric propagation, Scintillation), Radio transmission, Electrostatic fields, Electron density, Mathematical models.
Identifiers: F region, E region, Faraday effect, Legon.

A deep daily minimum in total electron content occurs a few hours after local sunset at Legon on most days during eight months of the year. This minimum can be explained in terms of an elliptical motion of ionization in the vertical E-W plane over the equator. It is suggested that the motion is caused by an electrostatic field, mapped into the F region along field lines from the dynamo region. The field is thought to be due to an accumulation of negative charge in a band just east of the sunset line in the E region. The mechanism described by Carlson and Walker (1972) is suggested as the cause for the field. The electrostatic field and its accompanying elliptical circulation moves westward with the speed of the sunset line (490 m/s). A computer model based on this mechanism produces results comparable with those obtained experimentally. The production of irregularities giving rise to spread F and scintillation is closely associated with this elliptical circulation. (Author)

AD-767 396/5GA PC$2.75/MF$1.45
University Coll London (England) Dept of Physics and Astronomy
DETERMINATION OF AIR DENSITY, TEMPERATURE AND WINDS AT HIGH ALTITUDE.
Interim rept. 1 Feb 72-31 Jan 73,
Gerald V. Groves, and David Rees. Mar 73, 19p
Rept no. Scientific-1 AFCRL-TR-73-0419
Grant AF-AFOSR-2264-72

Descriptors: (*Upper atmosphere, Scientific research), Ionosphere, Wind, Atmospheric temperature, Density, Diurnal variations, Great Britain.
Identifiers: Atmospheric density, Atmospheric circulation, *Thermosphere, Remote sensing, Optical radar.

The report reviews the research carried out at University College London in the following areas: The development and comparison of techniques for extending and improving wind and temperature measurement; winds and temperatures in the high-latitude and equatorial thermosphere; and, atmospheric circulation. (Modified author abstract)

AD-767 525/9GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
MEASUREMENT OF TOTAL OZONE AT WHITE SANDS MISSILE RANGE, NEW MEXICO.
Technical rept.,
Jagir S. Randhawa. Aug 73, 28p Rept no. ECOM-5505

Descriptors: (*Ozone, *Upper atmosphere), Guided missile ranges, New Mexico, Atmospheric sounding, Spectrophotometers, Diurnal variations.
Identifiers: Atmospheric composition, White Sands Missile Range.

A Dobson Spectrophotometer has been modified and set up at White Sands Missile Range, New Mexico (32 degrees 18 minutes N, 106 degrees 30 minutes W) to measure the total amount of ozone in a column of air extending from the ground to the top of the atmosphere. One year of data (1972) has been collected and analyzed. It indicates that the amount of ozone is maximum during the spring period (approximately 0.340 atm cm) and minimal in the fall (approximately 0.280 atm cm). (Author)

AD-767 527/5GA PC$2.75/MF$1.45
Army Electronics Command Fort Monmouth N J
DESIGN CONCEPT OF A FORWARD AREA RAWINSONDE SET (FARS).
Technical rept.,
Raymond L. Robbiani. Oct 73, 18p Rept no. ECOM-5512

Descriptors: (*Radiosondes, Design), Atmospheric sounding, Meteorological balloons, Tracking, Antennas, Military requirements.
Identifiers: FARS(Forward Area Rawinsonde Set), Forward area rawinsonde set.

The design concept of a Forward Area Rawinsonde Set (FARS) is described. This equipment will provide atmospheric soundings to an altitude of 12 km and to a ground range of at least 50 km. The set uses a unique tracking system which is the key to the large reduction in size and weight as compared to the Rawinsonde Set AN/GMD-1. The FARS will provide tracking accuracies at least as good as that of the Rawinsonde Set AN/GMD-1. The weight of the fully automated ground data receiving and sonde tracking system, excluding the power source, flight equipment and flight support items, will be approximately 100 pounds and 4 cubic feet in size. (Author)

AD-767 528/3GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
THE APPLICATION OF MINICOMPUTERS IN LASER ATMOSPHERIC EXPERIMENTS.
Technical rept.,
Kenneth O. White, Gerald T. Wade, and S. A. Schleusener. Sep 73, 27p Rept no. ECOM-5510

Descriptors: (*Atmospheric sounding, Data processing systems), Lasers, Pulse height analyzers, Real time.
Identifiers: Minicomputers, Data acquisition, Solid state lasers, Atmospheric attenuation, Laser beams, YAG lasers, Erbium lasers.

A minicomputer-based data acquisition and analysis system has been developed and applied to a variety of experiments involving the interactions between laser radiation and real and simulated atmospheres. This paper describes the system, its software and main applications. System features include signal analysis capability of both pulsed and continuous lasers, high data acquisition and computation rates, and real-time display of results. Basic system components include two minicomputers, four analog-to-digital converters, and a disc storage unit. One of the main applications of the system is as a dual parameter analyzer in experiments to determine the transmission of laser energy in controlled atmospheres. Efforts to complete these experiments were unsuccessful until minicomputer capability was added. The resulting real-time computation and display enabled real-time calibration and experiment monitoring. Minicomputer system application on other difficult experiments has also proven successful. (Author)

AD-767 606/7GA PC$4.50/MF$1.45
Boston Coll Chestnut Hill Mass Space Data Analysis Lab
SATELLITE DATA PROCESSING SYSTEMS.
Final rept. 1 Feb 70-31 Jan 73,
Rene J. Marcou, Robert W. Fioretti, Marvin E. Stick, Paul N. Pruneau, and Edward N. Richards.
28 Feb 73, 128p AFCRL-TR-73-0364
Contract F19628-70-C-0105

Descriptors: (*Upper atmosphere, *Data processing systems), (*Scientific satellites, Drag), (*Attitude control systems, Telemeter systems), Telemetering data, Accelerometers, Equations of motion.
Identifiers: OV1-15, satellite, OV1-21 satellite, OAR-901 satellite, DMS-1 satellite, Atmospheric density.

The report summarizes the mathematical and data analyses performed in the solution of scientific satellite data problems and describes the design and development of the processing systems which implemented these analyses. The processing systems described range in complexity from the initial reduction of the DMS-1 satellite accelerometer data to the detailed systems used in the reduction of data from the Cannonball II and OV1-21 satellites. A brief description of each satellite and its data processing requirements are given as an introduction to each system. The processing systems are in turn divided into sections by experiment type and output configuration. Many of the results described herein were incorporated by analysts and experimenters into presentations given at scientific meetings. (Author)

COM-73-11393/8GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
THE ATS-F RADIO BEACON--A PROGRESS REPORT,
R. N. Grubb. 1972, 14p NOAA-73080936
Pub. in Proceedings of Symposium on the Future Application of Satellite Beacon Measurements, Jun 72, p103-114.

Descriptors: (*Radio beacons, Meteorological satellites), (*Ionosphere, Electron density(Concentration)), Radio transmission, Modulation, Transponders, Ultrahigh frequencies, Microwave frequencies, Synchronous satellites.
Identifiers: ATS-F Satellite.

The ATS-F radio beacon transmitter, to be flown on the ATS-F geostationary satellite, is one component of the experiment designed to enable a ground experimenter, receiving the beacon transmission and measuring the dispersion and polarization to the received signals, to obtain information on the total electron content and its distribution along the transmission path. Following a description of the beacon information is given on verification of in orbit performance, the modulation phase and the dissemination of calibration information. The ATS-F satellite has a comprehensive transponder system at UHF and microwave frequencies which may form the basis for additional propagation measurements extending the frequency range of the Radio Beacon experiment.

COM-73-11396/1GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
COMMENTS ON: DETERMINATION OF AEROSOL SIZE DISTRIBUTION FROM SPECTRAL ATTENUATION MEASUREMENTS,
Ariel Cohen. 2 Feb 72, 3p NOAA-73080930
Pub. in Applied Optics, v11 n7 p1657-1658 Jul 72.

Descriptors: (*Aerosols, Particle size distribution), Light scattering, Atmospheric refraction, Spectrum analysis.

The author notes that Grassl's computation results, set forth in ibid 10,2434, 1971 'Determination of Aerosol Size Distribution from Spectral Attenuation Measurements', do not agree with the calculated results presented by the author even to an approximation. The author suggests that the main reason for the lack of agreement can be due to a different set of coefficients used by Grassl. The use of the same set of coefficients that include molecular extinction would have led to the same solution whether the method is exact or iterative. Any real difference in computational results, based on the same set of coefficients, must be attributed to some uncertainties in Grassl's computation.

COM-73-11443/1GA PC$2.75/MF$1.45
National Environmental Satellite Service, Washington, D.C.
REVIEW OF SATELLITE MEASUREMENTS OF ALBEDO AND OUTGOING LONG-WAVE RADIATION.
Technical memo.,
Arnold Gruber. Jul 73, 20p NOAA-TM-NESS-48 NOAA-73081609

Descriptors: (*Atmospheric radiation, Meteorological satellites), (*Albedo, Earth(Planet)), Meteorological data, Reviews, Intermediate infrared radiation.
Identifiers: Tiros satellites, Nimbus-2 satellite, Nimbus-3 satellite.

A review of satellite measurements of albedo and outgoing long-wave radiation was made. The review concentrated on zonal, hemispherical, and global averages for periods ranging from 15 days to several years. The results of various investigators was compared. Differences in results obtained from different satellites and years as well as differences in results between investigators using the same satellite data are discussed. Possible reasons for the differences are variable data-reduction procedures, differences in satellite sensors, variable sampling in space and time and real year-to-year variability. (Author)

COO-2249-2/GA PC$6.75/MF$1.45
Massachusetts Inst. Of Tech., Cambridge. Dept. Of Meteorology.
TRANSPORT PROCESSES AND TRACE CONSTITUTENTS IN THE STRATOSPHERE. PROGRESS REPORT FOR THE PERIOD NOVEMBER 20, 1972--JUNE 30, 1973.
D. M. Cunnold. 2 Apr 73, 91p
Contract AT(11-1)-2249

Descriptors: (*Stratosphere, *Heating), Electron drift, Infrared radiation, Ion drift, Mathematical models, Molecules, Motion, Oxygen ions, Ozone, Thermodynamics.

For abstract, see NSA 28 03, number 07703.

N-72-32414/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D. C.
THEORY OF PARAMETRIC PROCESSES IN PLASMA AND DETERMINATION OF ELECTRON CONCENTRATION ON THE POLAR IONOSPHERE.
M. A. Savchenko. Oct 72, 22p NASA-TT-F-14589, PR-101

Descriptors: (*Ionosphere, *Electron density), (*Plasma, Ionosphere), Electromagnetic radiation, Oscillations, Polar regions, Scattering.

For abstract, see NSA 28 02, number 03700.

N-72-32781/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
CALCULATIONS OF SYNCHROTRON EMISSION FROM THE TERRESTRIAL RADIATION BELTS.
R. Johnson. Aug 72, 36p NASA-TM-X-66015, X-693-72-254

Descriptors: (*Radiation belts, *Synchrotron radiation), Electrons, Emission, Latitude effect, Mhz range 01-100.

For abstract, see NSA 28 02, number 03723.

N-72-32783/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
LATITUDE AND LOCAL TIME DEPENDENCE OF PRECIPITATED LOW-ENERGY ELECTRONS AT HIGH LATITUDES.
G. Gustafsson. Aug 72, 45p NASA-TM-X-66035, X-645-72-293

Descriptors: (*Ionosphere, *Electron precipitation), Daily variations, Ev range 100-1000, Flux density, Kev range 01-10, Kev range 10-100, Latitude effect, Time dependence.

For abstract, see NSA 28 02, number 03724.

N-73-10378/GA PC$4.00/MF$1.45
California Univ., Los Angeles. Plasma Physics Group.
HIGH FREQUENCY HALL CURRENT INSTABILITY.
K. Lee, C. F. Kennel, and J. M. Kindel. Aug 70, 14p NASA-CR-130078, R-75

Descriptors: (*Electrojets, *Auroral zones), Currents, Electron density, Hall effect, Instability, Magnetic storms, Radio noise.

For abstract, see NSA 28 02, number 03725.

N-73-10379/GA PC$4.00/MF$1.45
Colorado Univ., Boulder.
AIRGLOW AND AURORAL EXPEDITION ABOARD THE CV-990 AIRCRAFT.
30 Aug 72, 35p NASA-CR-128392

Descriptors: Aircraft, Airglow, Aurorae, Calibration, Spectrometers.

For abstract, see NSA 28 03, number 06631.

N-73-10392/GA PC$5.45/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
SYNOPTIC STUDY OF THE NATURE AND EFFECTS OF FIELD ALIGNED LOW-ENERGY ELECTRON PRECIPITATION IN THE AURORAL REGIONS.
F. W. Berko. Oct 72, 108p NASA-TM-X-66065, X-646-72-384

Descriptors: (*Auroral zones, *Electron precipitation), Ionosphere, Magnetic fields, Satellites.

For abstract, see NSA 28 02, number 03726.

N-73-11816/GA PC$7.60/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
UK-5 VAN ALLEN BELT RADIATION EXPOSURE: A SPECIAL STUDY TO DETERMINE THE TRAPPED PARTICLE INTENSITIES ON THE UK-5 SATELLITE WITH SPATIAL MAPPING OF THE AMBIENT FLUX ENVIRONMENT.
E. G. Stassinopoulos. Oct 72, 226p NASA-TM-X-66098, X-601-72-388

Descriptors: (*Radiation belts, *Variations), (*Electrons, Radiation belts), (*Protons, Radiation belts), Magnetic fields.

For abstract, see NSA 28 02, number 03727.

N-73-11817/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
GREENSTADT'S BINARY INDEX CRITERION.
T. G. Northrop, and T. J. Birmingham. Nov 72, 12p NASA-TM-X-66105, X-640-72-425

Descriptors: (*Magnetosphere, *Shock waves), Magnetic fields, Solar wind, Velocity.

For abstract, see NSA 28 02, number 03728.

N-73-12384/GA PC$4.00/MF$1.45
Colorado Univ., Boulder.
AIRGLOW AND AURORAL EXPEDITION ABOARD THE CV-990 AIRCRAFT. FINAL REPORT, 1 JANUARY--28 FEBRUARY 1972.
28 Feb 72, 23p NASA-CR-129511

Descriptors: Aircraft, Airglow, Aurorae, Calibration, Data, Spectrometers.

For abstract, see NSA 28 03, number 06632.

N-73-12388/GA PC$4.00/MF$1.45
Iowa Univ., Iowa City. Dept. Of Physics and Astronomy.
PLASMA WAVE OBSERVATIONS NEAR THE PLASMAPAUSE WITH THE S3-A SATELLITE.
R. R. Anderson, and D. A. Gurnett. Jul 72, 27p NASA-CR-129243
Contract NAS5-11167

Descriptors: (*Plasmapause, *Plasma waves), (*Magnetic storms, *Radio noise), Kev range 10-100, Protons, Ring currents.

For abstract, see NSA 28 03, number 06662.

NP-19738/GA PC$3.00/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
POSSIBILITIES FOR LARGE-SCALE BALLOON RECORDINGS OF AURORAL-ZONE X-RAY EVENTS FROM NORTHERN SCANDINAVIA TO GREENLAND, AND THEIR COORDINATION WITH GEOS SATELLITE MEASUREMENTS.
H. Trefall. Jan 73, 19p
U.S. Sales Only.

Descriptors: (*X radiation, *Auroral zones), Balloons, Bremsstrahlung, Coordinates, Correlations, Electron precipitation, Greenland, Levels, Satellites, Scandinavia, Seasons, Stratosphere, Telemetry, Wind.

For abstract, see NSA 28 03, number 06633.

N73-27122/3GA PC$3.25/MF$1.45
Kiruna Geophysical Observatory (Sweden).
FIXED FREQUENCY IONOSONDE RECEIVER WITH A PHASE SWEPT INTERFEROMETER.
S. Olsson, and L. Liszka. Apr 72, 23p KGO-726

Descriptors: *Ionosondes, *Phase switching interferometers, *Receivers, Antenna arrays, Arrivals, Ionospheric disturbances.

For abstract, see STAR 1118

N73-27308/8GA PC$4.25/MF$1.45
Ionospharen-Institut Breisach (West Germany).
IONOSPHERE DATA, VERTICAL-ECHO-SOUNDING: FREIBURG, URSI-CODE 31, MARCH 1973 IONOSPHAEREN-DATEN, VERTIKAL-ECHO-LOTUNG: FREIBURG, URSI-CODE 31, MAERZ 1973.
Mar 73, 44p REPT-321F
In German and English.

Descriptors: *Balloon sounding, *Diurnal variations, *Meteorological charts, *Upper atmosphere, *Weather forecasting, Germany, Synoptic meteorology, Vertical distribution.

For abstract, see STAR 1118

N73-27309/6GA PC$3.75/MF$1.45
Danish Meteorological Inst., Charlottenlund.
DIAGNOSTICS OF THE MAGNETOSPHERE BY MEANS OF NATURALLY OCCURRING ELF AND VLF WAVES.
T. S. Joergensen. 1973, 32p R-34, ISBN-87-7478-078-6
Conf-Presented at Symp. On Plasma Waves, Instabilities and Interactions, Nord-Torpa, Norway, 6-12 Apr. 1972.

Descriptors: *Diagnosis, *Magnetosphere, Extremely low frequencies, Ionospheric propagation, Very low frequencies, Wave propagation.

For abstract, see STAR 1118

N73-27310/4GA PC$3.50/MF$1.45
Danish Meteorological Inst., Charlottenlund.
ORIENTATION OF AURORAL ARCS AND PRECIPITATION PATTERN OF AURORAL PARTICLES.
K. Lassen. 1973, 26p R-33, ISBN-87-7478-058-1

Descriptors: *Auroral arcs, *Electron precipitation, Geomagnetism, Magnetic disturbances, Plotting.

For abstract, see STAR 1118

N73-27311/2GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
O(D-1) PRODUCTION IN OZONE PHOTOLYSIS NEAR 310 NM.
C. Lin, and W. B. Demore. 15 Jul 73, 11p NASA-CR-122206, JPL-TM-33-635
Contract NAS7-100

Descriptors: *By-products, *Ozone, *Photolysis, *Yield, Atmospheric chemistry, Stratosphere.

For abstract, see STAR 1118

N73-27313/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ION COMPOSITION DURING THE FORMATION OF A MIDLATITUDE E SUB S LAYER.
A. C. Aikin, R. A. Goldberg, and A. Azcarraga. Jun 73, 14p NASA-TM-X-66276, X-625-73-166
Subm-Submitted for Publication.

Descriptors: *E region, *Ion density (Concentration), *Ionospheric ion density, *Mass spectrometers, *Sounding rockets, Equipment specifications, Ionospheric composition, Test equipment.

For abstract, see STAR 1118

N73-27314/6GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE NIMBUS 4 INFRARED SPECTROSCOPY EXPERIMENT. 2: COMPARISON OF OBSERVED AND THEORETICAL RADIANCE FROM 425-1450 CM(MINUS 1).
V. G. Kunde, B. J. Conrath, R. A. Hanel, W. C. Maguire, and C. Prabhakara. Jun 73, 36p NASA-TM-X-66275, X-622-73-160
Subm-Sponsored by NASA.

Descriptors: *Atmospheric radiation, *Nimbus 4 satellite, *Thermal emission, Atmospheric models, Carbon dioxide, Radiance, Radiometers, Water vapor.

For abstract, see STAR 1118

N73-27315/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NIMBUS 4 IRIS SPECTRA IN THE 750-1250/CM ATMOSPHERIC WINDOW REGION.
V. G. Kunde, B. J. Conrath, R. A. Hanel, and C. Prabhakara. May 73, 15p NASA-TM-X-66281, X-622-73-191
Subm-Submitted for Publication.

Descriptors: *Atmospheric windows, *Infrared interferometers, *Infrared spectrometers, *Nimbus 4 satellite, *Spectral resolution, Brightness temperature, Remote sensors, Surface temperature, Thermal emission.

For abstract, see STAR 1118

N73-27319/5GA PC$3.50/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
ESTIMATION OF THE ATMOSPHERIC EFFECTS IN THE PROBLEM OF COSMIC STUDY OF THE NATURAL RESOURCES OF THE EARTH BY EMISSION MEASUREMENTS FROM KOSMOS SATELLITES.
M. S. Malkevich, and A. S. Gurvich. Jul 73, 29p NASA-TT-F-14977
Contract NASW-2482
Tran-Transl. Into English of "Otsenka Roli Atmosfery V Zadache Izucheniya Prirodnykh Resursov Zemli Iz Kosmosa Po Izmereniyam Isluchenlya So Sputnilov", Acad. Of Sci. Ussr, Inst. Of Space Res., Moscow, Report Presented to the Meeting of the Sov.-AM. Working Group on Remote Sensing of the Natural Environment from Space, 12-17 Feb. 1973 32 p.

Descriptors: *Atmospherics, *Cosmos satellites, Cosmos 149 satellite, Infrared spectra, Solar radiation, Vapor phases, Water.

For abstract, see STAR 1118

N73-27325/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MODELS OF EARTH'S ATMOSPHERE (90 TO 2500 KM).
Space Vehicle Design Criteria (Environment). Mar 73, 63p NASA-SP-8021
Misc-Revised.

Descriptors: *Atmospheric density, *Atmospheric models, *Atmospheric temperature, *Upper atmosphere, Earth atmosphere, Mission planning, Spacecraft design, Torque.

For abstract, see STAR 1118

N73-27329/4GA PC$3.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
OBSERVABILITY OF HIGH ALTITUDE ATMOSPHERIC SCATTERING LAYERS.
D. M. Cunnold. 1972, 31p NASA-CR-112309, AIAA-PAPER-71-1110
Contract NAS1-9984
Misc-Revised.

Descriptors: *Aerosols, *Atmospheric scattering, *Optical equipment, *Satellite-borne instruments, Atmospheric boundary layer, Ozone, Telescopes.

For abstract, see STAR 1118

N73-27330/2GA PC$12.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Meteorology.
AEROSOL PHYSICAL PROPERTIES FROM SATELLITE HORIZON INVERSION.
Final Report.
C. R. Gray, H. L. Malchow, D. C. Merritt, R. E. Var, and C. K. Whitney. Jul 73, 215p NASA-CR-112311, R-758
Contract NAS1-11092
Subm-Prepared in Cooperation with Charles Stark Draper Lab., Inc.

Descriptors: *Aerosols, *Horizon scanners, *Remote sensors, *Temperature inversions, Algorithms, Atmospheric scattering, Ozone, Physical properties, Satellite observation.

For abstract, see STAR 1118

N73-27331/0GA PC$4.00/MF$1.45
Pakistan Space and Upper Atmosphere Research Committee, Karachi.
UPPER ATMOSPHERE WIND AND TEMPERATURE STRUCTURE AT SONMIANI DERIVED FROM THE ROCKET GRENADE EXPERIMENTS CONDUCTED DURING 1965 - 1967.
M. Rahmatullah. Mar 72, 38p NASA-CR-133401, W-118
Subm-Sponsored by NASA.

Descriptors: *Grenades, *Temperature measurement, *Upper atmosphere, *Wind measurement, Meteorological parameters, Pakistan, Rocket flight.

For abstract, see STAR 1118

N73-27335/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GLOBAL CHARACTERISTICS IN THE DIURNAL VARIATIONS OF THE THERMOSPHERIC TEMPERATURE AND COMPOSITION.
H. G. Mayr, A. E. Hedin, C. A. Reber, and G. R. Carignan. May 73, 43p NASA-TM-X-66295, X-621-73-136

Descriptors: *Diurnal variations, *Mass spectrometers, *Ogo-f, *Thermosphere, Atmospheric temperature, Mathematical models, Temperature measurement.

For abstract, see STAR 1118

N73-27341/9GA PC$5.00/MF$1.45
Weapons Research Establishment, Adelaide (Australia).
MEASUREMENTS OF THE BASIC ATMOSPHERIC PARAMETERS AT WOOMERA USING THE FALLING SPHERE, FEBRUARY TO JUNE 1972.
P. H. O. Pearson. Jan 73, 58p WRE-TN-787

Descriptors: *Atmospheric models, *Australia, *Falling spheres, *Meteorological parameters, *Rocket sounding, Atmospheric density, Atmospheric physics, Atmospheric pressure, Atmospheric temperature, Free fall.

For abstract, see STAR 1118

N73-27342/7GA PC$3.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, DECEMBER 1972.
Monthly bulletin, Dec. 1972.
Dec 72, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, F region, Maximum usable frequency.

For abstract, see STAR 1118

N73-27343/5GA PC$3.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, NOVEMBER 1972.
Monthly bulletin, Nov. 1972.

Nov 72, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, F region, Maximum usable frequency.

For abstract, see STAR 1118

N73-27344/3GA PC$3.00/MF$1.45
Kiruna Geophysical Observatory (Sweden).
UNUSUAL BEHAVIOUR OF THE IONOSPHERIC ELECTRON CONTENT DURING THE MAGNETIC STORM, 14-17 DECEMBER 1971.
S. Olsson. Apr 72, 9p KGO-728

Descriptors: *Diurnal variations, *Ionospheric electron density, *Magnetic storms, *Magnetic variations, *Winter, Graphs (Charts), Ionospheric storms, Polar cap absorption, Very low frequencies.

For abstract, see STAR 1118

N73-27381/5GA PC$7.00/MF$1.45
Minnesota Univ., Minneapolis. Cosmic Physics Group.
ELECTRON-PROTON SPECTROMETER.
Final Project Report.
J. R. Winckler. May 73, 99p NASA-CR-132786, CR-163
Contract NAS5-11687

Descriptors: *Electron probes, *Extraterrestrial radiation, *Radiation measurement, *Spectrometers, Electronic equipment, Ionizing radiation, Radiation belts.

For abstract, see STAR 1118

N73-27383/1GA PC$3.00/MF$1.45
Arizona Univ., Tucson. Lunar and Planetary Lab.
INFRARED SITE TESTING OF MT. LEMMON AND CATALINA OBSERVATORY.
Final Report.
G. P. Kuiper. 27 Jul 73, 5p NASA-CR-133415
Contract NGR-03-002-270

Descriptors: *Dawn chorus, *Electromagnetic noise, *Ionospherics, *Measuring instruments, Data acquisition, Diurnal variations, Equipment specifications.

For abstract, see STAR 1118

N73-27388/0GA PC$3.00/MF$1.45
Alaska Univ., College. Geophysical Inst.
STUDY OF ARTIFICIALLY GENERATED AND NATURAL AURORAS.
Final Report.
T. N. Davis. Apr 73, 11p NASA-CR-133298
Contract NSR-02-001-035

Descriptors: *Auroras, *Upper atmosphere, Aerobee rocket vehicle, Electron accelerators, Triangulation.

For abstract, see STAR 1118

N73-27389/8GA PC$4.50/MF$1.45
Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
PRIMARY ELECTRON SPECTROMETER, 18:63 UE: ELECTROSTATIC ANALYZER DESCRIPTION AND ENERGY SPECTRUM DETERMINATION.
M. B. Pongratz. Mar 73, 47p NASA-CR-133409, TN-BN-758
Contracts NSR-21-002-077, NGR-21-002-008

Descriptors: *Auroral spectroscopy, *Electron density (Concentration), *Electrostatic probes, *Nike-tomahawk rocket vehicle, Electron energy, Electron trajectories, Energy spectra, Numerical analysis.

For abstract, see STAR 1118

N73-27547/1GA PC$5.25/MF$1.45
Stockholm Univ. (Sweden). Inst. of Meteorology.
MEASUREMENTS OF SCATTERED SUNLIGHT IN THE MESOSPHERE DURING TWILIGHT.
G. Witt, J. E. Dye, and N. Wilhelm. Feb 73, 63p AP-8
Contracts RN-1-26, RN-1-31

Descriptors: *Light scattering, *Mesosphere, Atmospheric scattering, Centaur launch vehicle, Dayglow, European space programs, Molecules, Photometers, Polarimeters, Polarization characteristics, Rayleigh scattering, Rocket sounding, Twilight glow.

For abstract, see STAR 1118

N73-27718/8GA PC$10.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A STUDY OF 30-300 MEV ATMOSPHERIC GAMMA RAYS.
Ph.D. Thesis - Maryland Univ.
D. J. Thompson. Jun 73, 157p NASA-TM-X-66278, X-662-73-179
Subm-Submitted for Publication.

Descriptors: *Atmospheric radiation, *Balloon sounding, *Gamma rays, Photons, Radiation counters, Spark chambers.

For abstract, see STAR 1118

N73-28438/2GA PC$3.25/MF$1.45
Weapons Research Establishment, Salisbury (Australia).
THERMOSPHERIC OBSERVATIONS COMBINING CHEMICAL SEEDING AND GROUND BASED TECHNIQUES. PART 2: IONOSPHERIC DRIFTS AND THE SQ CURRENT SYSTEM.
K. H. Lloyd, C. H. Low, D. G. Felgate, D. Rees, and G. Haerendel. Feb 73, 25p WRE-TN-680(WR/D)-PT-2

Descriptors: *F region, *Ionospheric sounding, Australia, Electric fields, Skylark rocket vehicle, Thermosphere.

For abstract, see STAR 1119

N73-28441/6GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DIRECT OBSERVATIONS IN THE DUSK HOURS OF THE CHARACTERISTICS OF THE STORM-TIME RING CURRENT PARTICLES DURING THE BEGINNING OF MAGNETIC STORMS.
P. H. Smith, and R. A. Hoffman. Aug 73, 28p NASA-TM-X-70430, X-646-73-228
Subm-Submitted for Publication.

Descriptors: *Evening, *Magnetic storms, *Protons, *Ring currents, Explorer satellites, Magnetosphere, Plasmapause.

For abstract, see STAR 1119

N73-28442/4GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE BEHAVIOR OF THE PLASMAPAUSE AT MID-LATITUDES: ISIS-1 LANGMUIR PROBE MEASUREMENTS.
L. H. Brace, and R. F. Theis. Apr 73, 48p NASA-TM-X-70429, X-621-73-220
Subm-Submitted for Publication.

Descriptors: *Electron density (Concentration), *Electrostatic probes, *Isis-a, *Plasmapause, *Temperature measurement, Geomagnetism, Polar caps, Position (Location).

For abstract, see STAR 1119

N73-28443/2GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE ROLE OF EDDY TURBULENCE IN THE DEVELOPMENT OF SELF-CONSISTENT MODELS OF THE LOWER AND UPPER THERMOSPHERE.
S. Chandra, and A. K. Sinha. Aug 73, 33p NASA-TM-X-70431, X-621-73-229
Subm-Submitted for Publication.

Descriptors: *Atmospheric models, *Atmospheric turbulence, *Thermosphere, Atmospheric composition, Atmospheric temperature, Turbulent diffusion.

For abstract, see STAR 1119

N73-28446/5GA PC$4.25/MF$1.45
Stanford Univ., Calif. Radioscience Lab.
RECENT RESULTS FROM SATELLITE BEACON MEASUREMENTS.
A. V. Dorosa. Jun 73, 42p NASA-CR-133475, TR-15
Contract NGR-05-020-001

Descriptors: *Ionospheric electron density, *Radio beacons, *Satellite-borne instruments, Goe satellites, Gravity waves, Ionospheric storms, Scintillation, Solar activity.

For abstract, see STAR 1119

N73-28447/3GA PC$7.75/MF$1.45
Stanford Univ., Calif. Radioscience Lab.
THE MIDLATITUDE IONOSPHERIC RESPONSE TO FLUCTUATIONS IN SOLAR ACTIVITY UNDER LOW GEOMAGNETIC ACTIVITY CONDITIONS.
J. L. Bendito. May 73, 111p NASA-CR-133474, SU-TR-16
Contract NGR-05-020-001

Descriptors: *Ionospheric electron density, *Ionospheric ion density, *Solar radiation, Electron flux density, Numerical analysis, Solar flux density, Solar wind.

For abstract, see STAR 1119

N73-28457/2GA PC$4.25/MF$1.45
Danish Space Research Inst., Lyngby.
SATELLITE EXPERIMENT FOR MEASURING LOW FREQUENCY WAVES IN THE SOLAR WIND AND MAGNETOSPHERE.
A. Bahnsen, I. B. Iversen, H. Obayashi, K. Omo, and I. L. Rasmussen. 1973, 44p DSRI-73-01

Descriptors: *Heos b satellite, *Magnetosphere, *Satellite observation, *Solar wind, Bow waves, Electric fields, Experimental design, Interplanetary magnetic fields, Low frequencies, Satellite antennas, Satellite instruments.

For abstract, see STAR 1119

N73-28459/8GA PC$5.50/MF$1.45
Kiruna Geophysical Observatory (Sweden).
KIRUNA GEOPHYSICAL DATA. DATA SUMMARY 73/1-3, JANUARY-MARCH 1973.
G. Gustafsson. Mar 73, 68p

Descriptors: *Geophysical observatories, *Ground based control, *Ionospheric sounding, *Sweden, Auroras, Cosmic noise, Geomagnetism, Ionograms, Ionospheric propagation, Magnetic variations.

For abstract, see STAR 1119

N73-28827/6GA PC$6.75/MF$1.45
King's Coll., London (England). Dept. of Mathematics.
A SELF CONSISTENT THEORY OF TRIGGERED VLF EMISSIONS.
D. Nunn. 1973, 92p

Subm-Sponsored by Sci. Res. Council.

Descriptors: *Computerized simulation, *Cyclotron resonance, *Radio emission, *Very low frequencies, *Whistlers, Electrons, Magnetosphere, Morse code, Plasma-electromagnetic interaction, Self consistent fields, Sidebands, Trapped particles.

For abstract, see STAR 1119

RLO-2229-T-5-3/GA PC$3.00/MF$1.45
Alaska Univ., College. Geophysical Inst.
STUDY OF MAGNETOSPHERIC SUBSTORMS IN CONJUNCTION WITH THE VELA SATELLITE DATA. ANNUAL PROGRESS REPORT.
S. I. Akasofu. Apr 73, 6p
Contract AT(45-1)-2229

Descriptors: (*Magnetic storms, *Auroral zones), Magnetosphere, Plasma, Vela project.

For abstract, see NSA 28 03, number 06663.

UCRL-74577/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR QUALITY.
R. I. Pollack. 22 Feb 73, 5p CONF-730610-2

Descriptors: Air pollution, Emission, Mathematical models, Meteorology.

For abstract, see NSA 28 03, number 07811.

UCRL-74616/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MONTHLY MEAN VALUES OF EDDY DIFFUSION COEFFICIENTS IN THE LOWER STRATOSPHERE.
F. M. Luther. 4 Apr 73, 11p CONF-730614-2

Descriptors: (*Stratosphere, *Diffusion), (*Air pollution, Stratosphere), Anisotropy.

For abstract, see NSA 28 03, number 07812.

4B. Meteorology

AD-767 031/8GA PC$3.00/MF$1.45
Hawaii Univ Honolulu Dept of Meteorology
THE TYPHOONS OF OCTOBER 1970 IN THE SOUTH CHINA SEA: INTENSIFICATION, DECAY AND OCEAN INTERACTION.
Technical paper,
Colin S. Ramage. Jun 73, 47p Rept no. UHMET-72-05 ENVPREDRSCHF-Tech paper-4-73

Descriptors: (*Tropical cyclones, *South China Sea), Troposphere, Intensity, Marine meteorology, Infrared tracking, Meteorological satellites, Surface temperatures, Oceanographic data, Vortices, Weather forecasting, Barometric pressure, Cooling, Interactions.
Identifiers: Typhoon Iris, Typhoon Joan, Typhoon Kate, ITOS-1 satellite, ESSA-8 satellite, Upwelling, Air water interactions, Ocean surface, Spaceborne photography.

In October 1970, the South China Sea experienced three typhoons. Meteorological and oceanographic data were examined in an attempt to explain why the typhoons underwent intensity changes while over the South China Sea. The clearest relationship was found with troughs in the upper tropospheric westerlies -- intensification accompanied development of a middle and high cloud plume streaming northeastward from the storm area. (Author)

AD-767 035/9GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INSTRUMENT FOR DETECTION OF CLOSE THUNDERSTORMS,
I. M. Imyanitov, and V. E. Karpusha. 27 Aug 73, 36p Rept no. FTD-MT-24-706-73
Edited machine trans. of mono. Meteorological Equipment for Scientific Research, n.p., 1972 p46-67, by Frank C. Vaughan.

Descriptors: (*Thunderstorms, *Meteorological instruments), Lightning, Antennas, Radar echo areas, USSR.
Identifiers: Translations, Signal processing.

The article discusses the principles of construction of instruments to detect thunderstorms. The construction and testing of one of the instruments - the thunderstorm signal indicator, is described.

AD-767 073/0GA PC$4.75/MF$1.45
Hawaii Inst of Geophysics Honolulu
AN ATLAS OF PACIFIC ISLANDS RAINFALL.
Data rept. no. 25,
Ronald C. Taylor. Aug 73, 174p Rept no. HIG-73-9
Contract N00014-70-A-0016-0001

Descriptors: (*Rainfall, *Pacific Ocean Islands), Tropical regions, Meteorological charts, Statistical data, Tables.

The report contains monthly totals of rainfall for the period of record for 118 Pacific island stations selected from a list of 200. The mean, median, and extreme values, and standard deviation have been computed for each month and for the year. These data are the basis for a new estimate of mean monthly and annual rainfall for the tropical Pacific Ocean (30N - 30S). (Author)

AD-767 098/7GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
ON THE PREDICTION OF TURBULENCE IN BAROCLINIC ZONES,
Kenneth R. Hardy, Madoka Fukushima, Peter F. Lester, and Robert H. Stewart. 12 Sep 72, 7p Rept no. AFCRL-TR-73-0573
Availability: Pub. in Boundary-Layer Meteorology, v5 p245-250 1973.

Descriptors: (*Atmospheric motion, Turbulence), Convection(Atmospheric), Clear air turbulence, Ocean waves, Temperature.

The report describes some of the features of turbulence and briefly relates these to larger-scale processes within the atmosphere. There is also a section on turbulence in the oceans. The report concludes with several recommendations which, if carried out, should lead to improved understanding and prediction of turbulence. (Author)

AD-767 106/8GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
DOPPLER RADAR EVIDENCE FOR ANTICYCLONIC CIRCULATION IN A SEVERE CONVECTIVE STORM,
Ralph J. Donaldson, Jr. 1973, 5p Rept no. AFCRL-TR-73-0557
Availability: Pub. in Preprint Volume, AMS, Boston, Mass., Conference on Severe Local Storms (8th), 5p, 15-17 Oct 73.

Descriptors: (*Atmospheric motion, Doppler radar), (*Thunderstorms, Atmospheric motion), Atmospheric precipitation, Radar echo areas, Vortices.

Doppler radar is a useful tool for gaining information on winds within convective storms, using precipitation as a tracer of air flow. Velocities measured by a single Doppler radar, however, are merely components of the flow field directed along the radar beam. Nevertheless, there are several sets of circumstances wherein the incomplete velocity components provide important clues to the circulation within storms. A mesoscale vortex, for example, is depicted by a characteristic pattern of Doppler velocity, and its interpretation as a vortex becomes increasingly credible with its persistence. Well-organized Doppler velocity patterns suggestive of mesoscale vortices have been observed in Massachusetts on a few occasions. The pattern has always been associated with a severe thunderstorm and is generally cyclonic. In one exceptional case an intense anticyclonic circulation first appeared in a convective storm nearly an hour before the storm inflicted heavy wind damage at the ground. The storm was under surveillance by the AFCRL meteorological Doppler radar at Sudbury, Mass., with the antenna rotating in azimuth at various elevation angles. The development of the circulation was followed for about 30 minutes through the coarsely-resolved but distinctive velocity gradients displayed on the Plan Shear Indicator. (Author)

AD-767 107/6GA Reprint
Hawaii Univ Honolulu Dept of Physics and Astronomy
TURBULENCE SPECTRA, LENGTH SCALES AND STRUCTURE PARAMETERS IN THE STABLE SURFACE LAYER,
J. C. Kaimal. 8 Aug 72, 22p Rept no. AFCRL-TR-73-0576
Availability: Pub. in Boundary-Layer Meteorology, v4 p289-309 1973.

Descriptors: (*Atmospheric motion, Spectrum analyzers), Wind, Heat flux, Stability, Curve fitting, Graphics.
Identifiers: Richardson number, Spectrum analysis.

The paper describes the basic similarity in the spectral forms for velocity and temperature, and the cospectral forms for stress and heat flux in a stably stratified layer. A practical scheme is developed for estimating these spectra and cospectra using only height and Richardson number. From this development emerges certain simple relationships between Richardson number, turbulent dissipation rates, characteristic length scales and structure parameters. The paper also presents evidence for isotropy in the surface layer, and the dependence of the limiting wavelength for the 4/3 ratio between transverse and longitudinal velocity components on height and stability. (Author)

AD-767 158/9GA Reprint
Stanford Research Inst Menlo Park Calif
APPLICATION OF SOME NUMERICAL TECHNIQUES IN COMBINING SATELLITE AND CONVENTIONAL DATA IN THE TROPICS,
R. M. Endlich, and R. L. Mancuso. 17 Oct 72, 14p AROD-9432:8-EN
Contract DAHC04-71-C-0013
Revision of report dated 19 Jan 72.
Availability: Pub. in Jnl. of the Meteorological Society of Japan, v50 n6 p533-542, 28 Dec 72.

Descriptors: (*Weather forecasting, Photointerpretation), Meteorological satellites, Tropical regions, Cloud cover, Wind, Mathematical analysis.
Identifiers: Remote sensing.

Some techniques are described for objectively analyzing atmospheric variables, particularly winds and cloud motions, and for refining the analyses to improve their meteorological value. An example shows how tropical cloud patterns observed by satellites can be used to modify analyses of vorticity and divergence fields and the associated winds. Methods for balancing divergence in the vertical and for numerical advection were developed for use in numerical models; some

preliminary forecast results are illustrated. A proposed plan for combining various types of satellite and conventional data for input to tropical numerical prediction models is presented. (Author)

AD-767 214/0GA PC$3.00/MF$1.45
Environmental Technical Applications Center (Air Force) Washington D C
A RESUME ON THE STATE OF THE ART FOR SNOW FORECASTING.
Technical note,
Charles L. Brenton, Jr. Jul 73, 34p Rept no. USAFETAC-TN-73-6

Descriptors: (*Snow, *Weather forecasting), State-of-the-art reviews, Storms, Thermodynamics, Tracking, Numerical analysis.

The document discusses the various predictors and techniques used in forecasting snowfall and in delineating between frozen and liquid precipitation. Techniques applicable to short range, midrange, and extended range forecasts are included. Fifty-three references concerning snow forecasting in the United States are itemized. (Author)

AD-767 217/3GA PC$5.25/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE ILLINOIS WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Nov 72, 178p Rept no. Technical Paper-72-4

Descriptors: (*Meteorological charts, *Illinois), (*Weather forecasting, Catalogs), Barometric pressure, Statistical data, Tables.
Identifiers: Synoptic meterology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for the Illinois window. (There is a catalog for each of the 14 windows which cover the United States). The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type. The map type catalog is primarily intended for use with other forecast aids that stratify weather or specific weather parameters by map type. Once the catalog is prepared, a firm foundation has been established for the development of additional operational forecast techniques. (Modified author abstract)

AD-767 294/2GA PC$4.75/MF$1.45
Texas A and M Research Foundation College Station
AN INSTRUMENT SYSTEM FOR MEASURING ATMOSPHERIC TURBULENCE AND THE ERRORS INHERENT IN USING IT.
Technical rept.,
Franklin S. Darby. Jul 73, 166p* Rept nos. A/M-Ref-73-1T, TR-5 ECOM-0073-T-5-68
Contract DAAB07-68-C-0073

Descriptors: (*Anemometers, Design), (*Resistance thermometers, Design), (*Atmospheric motion, Measurement), Meteorological instruments, Data processing systems, Turbulence, Heat flux, Recording systems, Analog systems, Wiring diagrams, Programming(Computers), Reynolds number.
Identifiers: Themis project, Air water interactions, Atmospheric boundary layer.

A computer controlled instrument system for the measurement of Reynolds stresses and turbulent heat fluxes in the atmospheric boundary layer is described from an engineering and functional point of view. The errors inherent in using this instrument system are analyzed both by a theoretical approach and by experimental runs of two instruments side by side. The errors in heat flux and Reynolds stress measurements were found to be approximately five percent. (Author) Portions of this document are not fully legible.

AD-767 295/9GA PC$4.25/MF$1.45
Texas A and M Research Foundation College Station
EXPERIMENTAL DEVELOPMENT OF THE PREDICTIVE RELATIONS FOR THE EDDY EXCHANGE COEFFICIENTS FOR MOMENTUM AND HEAT IN THE ATMOSPHERIC BOUNDARY LAYER.
Research and development Technical rept.,
Paul A. Jensen. Jul 73, 105p Rept no. A/M-Ref-73-2T ECOM-0073-T-6
Contract DAAB07-68-C-0073

Descriptors: (*Atmospheric motion, Turbulence), Heat transfer, Momentum, Micrometeorology, Partial differential equations, Anemometers, Wind, Graphics.
Identifiers: *Atmospheric boundary layer, Themis project, Air water interactions.

Direct measurements of the eddy fluxes of momentum and heat were made in the atmospheric boundary layer simultaneously with measurements of the profiles of average wind velocity and temperature to evaluate the capability for functional definition of the eddy exchange coefficients in terms of the mean parameters. The eddy exchange coefficients for both momentum and heat, (K sub m) and (K sub h), respectively, were found to depend strongly on atmospheric stability, both increasing with instability. (K sub m) was found to increase with increasing wind velocity, while no such relation was noted for (K sub h). Thus, as expected, but contrary to many earlier investigations based on mean measurements alone, the assumption of constancy of (K sub m) and (K sub h) or their ratio is not substantiated. Several postulated functional forms for (K sub m) and (K sub h) were investigated and quantitatively assessed. (Author)

AD-767 297/5GA PC$2.75/MF$1.45
Meteorology Research Inc Altadena Calif
WARM FOG AREA SEEDING STUDIES.
Final rept. 15 Feb 72-31 May 73,
Theodore B. Smith, and Donald M. Takeuchi. 20 Jul 73, 22p Rept no. MRI-73-FR-1090 AFCRL-TR-73-0437
Contract F19628-72-C-0236

Descriptors: (*Fog, Scattering), (*Landing fields, Fog), Visibility, Aerosol generators, Urea, Encapsulation, Wind, Velocity, Samplers, Military facilities, California.
Identifiers: *Fog dispersal, Weather modification, Vandenberg Air Force Base.

Field operations to investigate the airborne area seeding concept on warm fog modification were carried out at Vandenberg Air Force Base, California, during July 1972. Two test operations were carried out. The first test was accompanied by aircraft control problems due, in part, to shifting winds. Results of the second test were tracked by radar, but higher winds than estimated caused the drops to be carried out as separate lines. The test operations indicate some of the operational problems which may be encountered in carrying out the area seeding concept. (Modified author abstract)

AD-767 371/8GA PC$3.00/MF$1.45
General Dynamics San Diego Calif Electronics Div
OCEAN BASED INFRARED TEMPERATURE PROFILER.
Semi-annual rept. 1 Jan-31 Jul 73,
C. R. Claysmith. 20 Aug 73, 18p
Contract N00014-72-C-0175
See also report dated 5 Mar 73, AD-757 799.

Descriptors: (*Meteorological instruments, Marine meteorology), Atmospheric temperature, Diffraction gratings, Optical equipment, Electronic equipment, Design, Sea water, Humidity, Infrared radiation.

During the reporting period the predesign of the temperature/relative humidity profiler (RIAPS 1) was completed, and detailed design drawings are being prepared. Field testing of the present temperature profiler (Sensor 1) has continued, resulting in considerable amounts of data which are being used to optimize the instrument transmission functions, and to determine the overall reliability of the instrument.

AD-767 376/7GA PC$3.00/MF$1.45
Calspan Corp Buffalo N Y
AN INVESTIGATION OF THE MICROPHYSICAL AND MICROMETEOROLOGICAL PROPERTIES OF SEA FOG.
Annual summary rept. no. 1,
Eugene J. Mack, Roland j. Pilie, and Warren C. Kocmond. May 73, 46p Rept no. CALSPAN-CJ-5237-M-1
Contract N00019-73-C-0094
Report on Project Sea Fog.

Descriptors: (*Fog, Marine meteorology), Microstructure, Water vapor, Particle size, Distribution functions, Visibility, Pacific ocean, California.

Measurements of the microphysical and micrometeorological characteristics of two fogs occurring at sea 30 nmi off the coast of California were obtained. The fogs exhibited formation features, vertical temperature structure and microphysical characteristics similar to those observed on shore in California coastal fog. One of the fogs formed over cold water, while the other formed over relatively warm water; in each instance, marked visibility improvements were observed at the surface downwind of abrupt gradients in surface water temperature. The observations also show that fog occurrence at the surface at distances exceeding 30 nmi off shore is definitely a diurnal effect and indicate that radiational cooling at the top of the fog is much more important than has been previously considered. (Author)

AD-767 526/7GA PC$2.75/MF$1.45
Army Electronics Command Fort Monmouth N J
LIDAR MEASUREMENT OF TEMPERATURE: A NEW APPROACH.
Technical rept.,
James B. Mason. Sep 73, 18p Rept no. ECOM-5506

Descriptors: (*Atmospheric temperature, Measurement), Opdar, Atmospheric sounding, Absorption spectrum, Radar reflections, Correlation techniques.
Identifiers: Tunable lasers, Temperature measurement, Remote sensing.

It is shown that the thermodynamic distribution of rotational states within a molecular absorption band of a gas can be probed by means of lidar differential absorption to obtain measurements of the gas temperature. A technique for exploiting this is described, and preliminary calculations indicate that although relatively weak absorptions are involved, sensitivities should be sufficient for profile measurements of temperature in the atmosphere. (Author)

AD-767 550/7GA PC$3.75/MF$1.45
Texas A and M Univ College Station Dept of Oceanography and Meteorology
MICROSTRUCTURE OF COLD FRONTS AND IMPLICATIONS AS TO THEIR DETECTION BY RADAR.
Technical rept.,
Grant C. Aufderhaar. Jul 73, 80p Rept nos. TR-9, A/M-Ref-73-5-T ECOM-0073-T-9-68
Contract DAAB07-68-C-0073

Descriptors: (*Air mass analysis, Micrometeorology), Meteorological radar, Atmospheric temperature, Wind, Radar reflections, Theses.
Identifiers: Cold fronts, Themis project.

Data collected by two automatic micrometeorological towers and film from the radar film library at Texas A+M University were used to investigate the variations in some micrometeorological features during three cold-frontal passages. The results were: (1). Analysis of horizontal gradients of temperature and moisture in the lowest 32 m of the atmosphere and comparison of pictures of radar return reveal that large values of refractivity due to these gradients can be correlated with an organized pattern of radar return. (2). Wind fields were examined through the front and the presence of 'gust lines', evident in the microscale tower data, was not detected on the radar. (3). Vertical profiles of wind and dry-bulb and wet-bulb temperature were determined by use of the log-power relationship. Some regular changes were noted in the log-power, wind profile variables, but those in the log-power dry-bulb and wet-bulb temperature profiles varied irregularly. Also, roughness length appeared to be a function of stability. (4). Soil and air temperatures through the frontal zone were compared by looking at the variations in flux of soil heat versus the temporal gradients of temperature in the atmosphere, with some regular results. (Author)

AD-767 554/9GA PC$4.50/MF$1.45
Texas A and M Univ College Station Dept of Oceanography and Meteorology
NUMERICAL TECHNIQUES FOR THE ANALYSIS OF DIGITAL RADAR DATA WITH APPLICATIONS TO METEOROLOGY AND HYDROLOGY.
Technical rept.,
Douglas R. Greene. Jul 73, 145p Rept nos. TR-4, A/M-Ref-71-24-T ECOM-0073-T-4-68
Contract DAAB07-68-C-0073
Report on Project THEMIS Prediction of Environmental Parameters.

Descriptors: (*Meteorological radar, Data processing systems), (*Storms, *Weather forecasting), Numerical methods and procedures, Real time, Feasibility studies, Theses.
Identifiers: Themis project, Signal processing.

Investigation has been conducted on the feasibility of using digital radar for 'real-time' meteorological and hydrological applications. Numerical techniques have been developed that enhance the usefulness of weather radar data in these applications. Through the use of digital radar data measured at successive elevation angles in a storm system, an analysis technique is developed that presents a new dimension in mesoscale analysis and gives means of detecting areas of 'explosive development' in severe storms. This indicator presents the three-deimensional characteristics of a storm system in a two-dimension display of vertically-integrated liquid-water content (VIL). Constant altitude reflectivity maps, CAPPI type displays, which are useful in mesoanalysis and/or the study of thunderstorm dynamics, also may be generated from digital radar data. The VIL-analysis technique is used to investigate several tornado-producing meso-systems by use of digital weather radar data collected by the National Severe Storms Laboratory, NOAA, Norman, Oklahoma. (Modified author abstract)

AD-767 556/4GA PC$3.50/MF$1.45
Texas A and M Univ College Station Dept of Oceanography and Meteorology
A STUDY OF THE APPLICABILITY OF WEATHER RADAR IN STREAMFLOW FORECASTING.
Technical rept.,
Robert G. Curry. Jul 73, 64p Rept nos. TR-7, A/M-Ref-73-3-T ECOM-0073-T-7-68
Contract DAAB07-68-C-0073
Report on Project THEMIS Prediction of Environmental Parameters.

Descriptors: (*Rainfall, Predictions), Floods, Meteorological radar, Simulation, Texas, Theses.
Identifiers: *Flood forecasting, Flood routing, Streamflow, Watersheds, Surface water runoff, Hydrogaphy, Hydormeteorology, Themis project.

Streamflow routing techniques are applied for hydrograph synthesis to the 234 square mile East Yegua Creek basin in Central Texas. Digitized data for a grid size of 5 mi by 5 mi are obtained from a 10.3-cm radar and are used in the estimation of rainfall over the basin. These data are compared with rainfall measured by 27 recording and non-recording gages spaced uniformly over the basin. Hydrographs have been synthesized for four flood events based on radar-estimated and actually-observed rainfall. The results, when compared with the observed hydrographs, are encouraging. The routing coefficients, however, vary considerably with antecedent soil-moisture conditions, rainfall intensity, and time of the year. The primary difficulty in the use of radar estimated rainfall was that rainfall intensities were underestimated rather severely. The spatial variability of the rainfall was quite good and revealed the capability of radar to measure mesoscale variations of rainfall in a 'real-time' sense. (Author)

AD-767 558/0GA PC$4.25/MF$1.45
Texas A and M Univ College Station Dept of Oceanography and Meteorology
MESOSCALE DIVERGENCE, VORTICITY, AND VERTICAL MOTION COMPARED TO RADAR AND RAINFALL PATTERNS.
Technical rept.,
Donald M. Withers. Jul 73, 104p Rept nos. TR-8, A/M-Ref-73-4-T ECOM-0073-T-8-68
Contract DAAB07-68-C-0073
Report on Project THEMIS Prediction of Environmental Parameters.

Descriptors: (*Weather forecasting, Atmospheric motion), Meteorological radar, Radar reflections, Thunderstorms, Oklahoma, Theses.
Identifiers: Themis project.

Divergence, relative vorticity, and vertical motion are computed from mesoscale surface and upper-air network data collected by the National Severe Storms Laboratory, Norman, Oklahoma. Results are compared to radar and rainfall patterns recorded simultaneously. The two cases chosen are cold frontal passages; one has a strong squall line (April 26, 1969), and the other has a line of scattered echoes (May 16, 1969). Computed values of divergence, vorticity, and vertical motion are consistent with each other and, in general, with the radar and rainfall patterns. The largest difference is a large upward vertical motion computed for a region of dissipating echo. (Author)

AD-767 564/8GA PC$4.50/MF$1.45
Texas A and M Univ College Station Dept of Oceanography and Meteorology
TEMPORAL VARIABILITY IN INTENSITY-HEIGHT PROFILES OF A SEVERE STORM USING DIGITAL RADAR DATA.
Technical rept.,
Yates J. Canipe. Jul 73, 141p Rept nos. TR-10, A/M-Ref-73-6-T ECOM-0073-T-10-68
Contract DAAB07-68-C-0073
Report on Project THEMIS Prediction of Environmental Parameters.

Descriptors: (*Weather forecasting, *Storms), Meteorological radar, Radar reflections, Rainfall, Real time, Oklahoma, Theses.
Identifiers: Themis project.

Recent investigations based on data from the National Severe Storms Laboratory (NSSL), National Oceanic and Atmospheric Administration (NOAA), Norman, Oklahoma, have revealed numerous 'real-time' applications of these data. Proper handling of these data can yield information on potentially severe storms that will improve greatly the ability to forecast their development and decay. Between 1600 CST and 1700 CST, two thunderstorm cells were observed to the southwest of Chickasha, Oklahoma, by NSSL radar. The first cell was in a decaying stage; however, the second cell remained somewhat docile until 1630 CST when it experienced almost explosive development. This study was concerned with what happened to the second cell. Detailed analysis indicated that satellite cells of possibly great importance were present. Composite maps were constructed to display the three-dimensional centers in two dimensions. Another type of analysis used to complete the investigation was the horizontal integration of liquid water. The feasibility of using digital radar in assessing storm development was investigated also. In particular, techniques were formulated that explain partially the explosive development associated with the tornado occurrence. (Modified author abstract)

AD-767 594/5GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
K SUB A BAND RADAR WEATHER DETECTION.
Instrumentation papers,
Wilbur H. Paulsen, and Pio J. Petrocchi. 11 Jul 73, 39p Rept nos. AFCRL-TR-73-0407, AFCRL-IP-193

Descriptors: (*Meteorological radar, K band), Fog, Wind, Radar reflections, Removal.
Identifiers: AN/CPS-9, *Fog dispersal, Cloud seeding, Performance evaluation, Wind direction, Wind velocity.

A scanning K sub a band radar was developed and successfully used in a fog modification program to track both the seeding aircraft and the seeding material that was dispersed from the aircraft over water. This radar showed that the lines of seeding material were separated farther apart than planned due to much higher winds at the aircraft altitude than were expected and tracked the lines of seeding material as they descended and moved in toward the shore. The radar was also used to support other fog modification studies based on the use of heat plumes to evaporate the fog, and an evaluation was made of its usefulness in observing wind directions and wind shears as a function of height. (Author)

COM-73-11401/9GA PC$4.25/MF$1.45
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environamental Data Service.
A NOTE ON A GAMMA DISTRIBUTION COMPUTER PROGRAM AND GRAPH PAPER.
Technical rept.,
Harold L. Crutcher, Gerald L. Barger, and Grady F. McKay. Apr 73, 118p NOAA-TR-EDS-11 NOAA-73082106

Descriptors: (*Meteorological data, Statistical analysis), (*Precipitation(Meteorology), Gamma function), (*Gamma function, Computer programs), Statistical distributions, Curve fitting, Graphic methods, FORTRAN, Plotters.
Identifiers: FORTRAN 4 programming language.

The gamma distribution function may be used as a model for many sets of data. The electronic computer program in the Formula Translator (FORTRAN) 4 for this function here provides the analytic solution to a set of data, gives the probabilities of exceeding or not exceeding arbitrary amounts, and indicates the amounts exceeded or not exceeded for arbitrary probabilities. The developed gamma probability plotting paper serves also for the special cases of the chi-squared, the exponential, and the Poisson distribution functions. Estimates of the scale and shape parameters permit construction of the graph. The graph paper may be used to estimate the scale and shape parameters. The program, in its general form, permits a maximum of 52 entries, which will suffice for those dealing with weekly data through the year. In addition, in precipitation studies, the

user has the option to compute in one pass of the data the two duration and three duration period distributions. These computations are done without program change but by appropriate changes in the control cards. This feature is not limited to the study of precipitation data. An option permits the computation of the required probabilities and inverses when only the scale and shape parameters are given. (Modified author abstract)

COM-73-11412/6GA PC$4.75/MF$1.45
Oklahoma Univ., Norman. School of Aerospace and Mechanical Engineering.
MEASUREMENTS OF LABORATORY VORTICES.
Final rept. Jul 72-Jun 73,
M. C. Jischke, and M. Parang. Jun 73, 55p NOAA-73082301
Grant NOAA-N22-2000-72(G)

Descriptors: (*Vortices, flow measurement), (*Tornadoes, Simulation), Flow distribution, Velocity measurement, Pressure measurement.

Lack of complete data on the vortex instability and the absence of data on the velocity fields provided the motivation for the present study. Experiments have been conducted with the apparatus designed by Ward in which the variation of the critical swirl angle with both the aspect ratio of the apparatus h/radius of the convergent zone, (h equals height) and the volumetric flow rate Q have been measured. Flowfield measurements were conducted in the convergent zone of the apparatus. Specifically, velocity components, surface pressure and core angular velocity results are presented.

COM-73-11497/7GA Reprint
National Severe Storms Lab., Norman, Okla.
THE DIURNAL WIND VARIATION IN THE LOWEST 1500 FT IN CENTRAL OKLAHOMA: JUNE 1966-MAY 1967,
Kenneth C. Crawford, and Horace R. Hudson. 5 Sep 72, 7p NOAA-73080910
Revision of report dated 29 Nov 71. Sponsored in part by WKY Television Systems, Inc., and National Aeronautics and Space Administration, Washington, D.C.
Pub. in Jnl. of Applied Meteorology, v12 n1 p127-132 Feb 73.

Descriptors: (*Wind(Meteorology), Oklahoma), Wind direction, Wind velocity, Diurnal variations.
Identifiers: Oklahoma City(Oklahoma).

One year of wind data from a television tower in northern Oklahoma City has been analyzed on a diurnal basis. The annual mean speeds below the third level at 296 ft are lowest at night and highest during the day, and conversely the speeds up to the seventh level at 1458 ft are lowest during the day and highest at night. Generally, speed changes occur in short time periods shortly after sunrise and near sunset. Resultant wind directions veer most with height between 1700-1000 CST and least during midday. At all levels winds veer with time between 2100 and approximately 1100 CST and then back with time during the remaining hours. (Author)

COM-73-11499/3GA Reprint
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
SEASONAL VARIATION OF TROPICAL HUMIDITY PARAMETERS,
E. M. Rasmusson. 1972, 45p NOAA-73080935
Pub. in The General Circulation of the Tropical Atmosphere and Interactions with Extratropical Latitudes, p193-237 1972.

Descriptors: (*Humidity, Tropical regions), (*Atmospheric circulation, Tropical regions), Seasonal variations, Heat balance, Water balance.

The study deals with the zonal average monthly variations in humidity, horizontal vapor transfer, vertically integrated flux divergence, and water balance of the total atmospheric column in the tropics. The author brings out the broad-scale features of the seasonal cycle, which he hopes, can serve as a climatological framework for future regional water and heat balance studies. Low-level wind fields in the tropics, the humidity field, relative humidity, horizontal flux, zonal flux, meridional flux, and water balance are discussed. Tabulated data and maps are included.

COM-73-11505/7GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
AN ELECTROMAGNETIC TECHNIQUE FOR TORNADO DETECTION,
W. L. Taylor. 1973, 3p NOAA-73080928
Pub. in Weatherwise, v26 n2 p70-71 Apr 73.

Descriptors: (*Tornadoes, Detection), (*Spectrum signatures, Tornadoes), Radio waves.

To test the feasibility of an electromagnetic technique of tornado detection, fifteen observational units were operated within or near 'tornado alley' between 15 March and 15 September 1972. Each unit continuously recorded the number of bursts per minute of high impulse rates at a frequency of 3.16 MHz. Two amplitude threshold levels corresponding to nominal impulse field strengths expected at distances less than about 15 nautical miles and less than about 30 n. mi were employed to give an approximate indication of range. The results suggest that this technique should not be considered as an independent tornado detector on an operational basis, but rather as an aid in warning of tornadoes in conjunction with radar and other information.

COM-73-11506/5GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.
SNOW CRYSTAL FORMS AND THEIR RELATIONSHIP TO SNOWSTORMS,
Helmut K. Weickmann. 1972, 14p NOAA-73080919
Summary in French.
Pub. in Jnl. de Recherches Atmospheriques, v6 n1,2,3 p603-615 Jan-Sept 72.

Descriptors: (*Snow, *Crystal structure), (*Snowstorms, Theories), Dendritic crystals, Cloud physics, Cloud seeding, Atmospheric temperature.

Several typical snow crystal forms are discussed and it is shown how they are related to the large scale storm structure. The formation of specific forms, for instance, dendritic stars and spatial crystals are discussed. Three basic precipitation systems are separated due to the particle type that they discharge as well as due to the typical cloud system in which they originate. An illustration shows the dependence of major crystal forms on temperature in a water-saturated environment.

COM-73-11529/7GA PC$3.50/MF$1.45
Hawaii Univ., Honolulu. Dept. of Meteorology.
STEADY AND TRANSIENT WAVES EXCITED BY DIABATIC HEAT SOURCES DURING THE SUMMER MONSOON.
Final rept.,
Takio Murakami. Jul 73, 52p UHMET-73-03 NOAA-73090503
Grant NOAA-NG-3272

Descriptors: (*Monsoons, *Atmospheric circulation), Southeast Asia, Atmospheric models, Mathematical models, Numerical integration.
Identifiers: Primitive equations.

A simple nine-layer model has been proposed to simulate the mean monsoonal circulation and its associated 16-day wind fluctuations in the monsoon region. Within the scope of the present study, a nine-layer representation with a latitudinal resolution of 4 degrees and a zonal wavenumber range of 1 to 3 appears to be adequate for describing most of the characteristic features of the monsoon circulation. However, a higher degree of resolution in space and wavenumber regime is certainly desirable for further study of the interactions of monsoon circulation with equatorial stratospheric waves, confined to within 5 to 10 degrees of the equator, and barotropic instability waves of wavenumbers 5 to 8.

COM-73-11530/5GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.
HURRICANE MODELING EXPERIMENTS WITH A NEW PARAMETERIZATION FOR CUMULUS CONVECTION.
Technical memo.,
Stanley L. Rosenthal. Jul 73, 45p NOAA-TM-ERL-WMPO-4 NOAA-73083101

Descriptors: (*Hurricanes, Mathematical models), (*Cumulus clouds, Convection), Atmospheric models, Wind(Meteorology), Cloud physics, Troposphere.
Identifiers: Planetary boundary layer.

Hurricane modeling experiments that use a new method of cumulus parameterization are described. The model provides realistic simulations of the hurricane-wind and temperature fields. However, subsidence between cumulus elements tends to dry out the low troposphere to an unrealistic degree. It is concluded that this results from too little detrainment in the lower levels when the planetary boundary layer shows divergence or weak convergence. (Author)

COM-73-11533/9GA PC$5.00/MF$1.45
National Weather Service, Columbia, S.C.
SOUTH CAROLINA HURRICANES OR A DESCRIPTIVE LISTING OF TROPICAL CYCLONES THAT HAVE AFFECTED SOUTH CAROLINA,
John C. Purvis, and H. Landers. 1973, 56p NOAA-73080905
Prepared in cooperation with National Weather Service, Clemson, S.C., and the South Carolina Disaster Preparedness Agency.

Descriptors: (*Hurricanes, *South Carolina), Reviews, Hurricane tracking, Warning systems, Storms, Gales, Charts.

The publication contains a descriptive listing of tropical cyclones that have affected South Carolina and for which records are available. The record begins with two storms in the 17th century and continues to date. Introductory notes on hurricane phenomena and September gales are followed by a statement on modern tracking and warning. Finally there is a chart showing the number of tropical cyclones by month, percent of seasonal total and the number of cyclones per year, for various time periods.

COM-73-11543/8GA Reprint
National Oceanic and Atmospheric Administration, Princeton, N.J. Geophysical Fluid Dynamics Lab.
CUMULATIVE RESULTS OF TESTING A METEOROLOGICAL-MATHEMATICAL MODEL: THE DESCRIPTION OF THE MODEL,
K. Miyakoda. 4 Jul 73, 36p NOAA-73082914
Revision of report dated 21 Apr 72.
Pub. in Proceedings of the Royal Irish Academy, v73 secA n9 p99-130 1973.

Descriptors: (*Weather forecasting, Mathematical models), (*Atmospheric circulation, Mathematical models), Atmospheric models, Finite difference theory, Heat budget, Water vapor.

A series of two-week forecasts were made to a reasonable extent of success by an atmospheric general circulation model. The model is hemispheric, and has the grid size of about 270 km at mid-latitude, and 9 levels in the vertical, including the boundary layer, the troposphere and the middle stratosphere. The effects of radiation, water vapor and its phase change, evaporation, sensible heat flux and subgrid-scale turbulence effect are incorporated. The distribution of oceans and continents, the mountains, the sea surface temperature and the snow coverage are specified. These characteristics of the model have been described elsewhere only in fragmentary or obscure form. The purpose of this paper is, therefore, to portray in some detail these model's profile, including the basic equations, the Reynolds stress, the water vapor processes as well as the finite difference equations. Also the energy equation in finite difference form is derived. (Author)

COM-73-11557/8GA PC$3.00/MF$1.45
National Weather Service, Silver Spring, Md. Weather Analysis and Prediction Div.
NATIONAL WEATHER SERVICE, MAY 1971--APRIL 1972: PUBLIC FORECAST VERIFICATION SUMMARY.
Technical memo.,
Alexander F. Sadowski, and Geraldine F. Cobb. Jul 73, 33p NOAA-TM-NWS-FCST-19 NOAA-73082807

Descriptors: (*Weather forecasting, Statistical analysis), Precipitation(Meteorology), Atmospheric temperature, Performance evaluation.

Performance scores for May 1971 - April 1972 of guidance from the National Meteorological Center (NMC) and State forecasts (FPs) from the Weather Service Forecasts Offices (WSFOs) are summarized. The small improvement by the succeeding echelon is evident again, and most showed better scores then previous years. NMC had the best resolution for the second and third period precipitation forecasts during May 1971-October 1971, but WSFOs did better in November 1971-April 1972. Both echelons continued to have a small bias of underforecasting temperatures for all periods. (Author)

COM-73-50830/1GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.
THE MODIFICATION OF GREAT LAKES WINTER STORMS.
Technical rept.,
Helmut K. Weickmann. Jan 73, 113p NOAA-TR-ERL-265, APCL-26 NOAA-73080802
Paper copy available from GPO $1.65 as C55.13:ERL265-APCL26.

Descriptors: (*Storms, Weather forecasting), (*Snowstorms, *Great Lakes Region), (*Cloud seeding, Snowstorms), Stratocumulus clouds, Winter, Snowfall.

In the Great Lakes region of the U.S.A., shallow but intensive winter storms form through a combination of cold continental air moving over large still-unfrozen and even warm water surfaces. These storms, depending on their trajectories over the lakes and their persistence, may precipitate large amounts of snow onto the downwind shorelines of the Great Lakes. Natural freezing nuclei-concentration causes heavily rimed crystals to form; seeding increases their number, and prevents riming, which in turn causes smaller crystal fall velocities. Consequently, these smaller velocities mean a longer transport of snow downwind and away from the urban and industrial centers near the shores. The experiment is designed around a mesoscale numberical model and a microphysical model of snowcrystal formation. The great variability of the cloud systems prevents a clear definition of a homogeneous sample of comparable experiments and, therefore, makes a clear statistical design impossible. The execution involves seeding from the ground and air, tracking the seeding agent through the cloud system with an airborne freezing nucleus counter, and analyzing AgI nuclei in the precipitated snowcrystals. (Modified author abstract)

CONF-730610-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
COMMENTS ON THE GAMMA DISTRIBUTION AND USES IN RAINFALL DATA.
L. R. Shenton, and K. O. Bowman. 1973, 8p

Descriptors: (*Rain, *Statistics), Distribution, Functions, Randomness.

For abstract, see NSA 28 03, number 07630.

EUR-4943/GA PC$5.75/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
13TH 1971 METEOROLOGICAL YEARBOOK.
G. Bollini, and C. Gandino. Mar 73, 72p
In Italian. U.S. Sales Only.

Descriptors: (*Meteorology, *Data), Earth atmosphere, Euratom, Tables, Temperature measurement.

For abstract, see NSA 28 03, number 07715.

N73-27021/7GA PC$3.00/MF$1.45
Dayton Univ. Research Inst., Ohio.
A MODEL OF WIND SHEAR AND TURBULENCE IN THE SURFACE BOUNDARY LAYER.
J. K. Luers. Jul 73, 43p NASA-CR-2288
Contract NAS8-26600

Descriptors: *Atmospheric turbulence, *Boundary layer flow, *Turbulent flow, *Wind shear, Flow characteristics, Geostrophic wind, Numerical analysis, Surface properties.

For abstract, see STAR 1118

N73-27306/2GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HOT AND COLD ATMOSPHERES FOR VANDENBERG AFB, CALIFORNIA (1973 VERSION).
D. L. Johnson. 26 Jun 73, 50p NASA-TM-X-64756

Descriptors: *Atmospheric models, *California, *High altitude, Annual variations, Atmospheric density, Atmospheric pressure, Atmospheric temperature.

For abstract, see STAR 1118

N73-27307/0GA PC$6.25/MF$1.45
Danish Meteorological Inst., Copenhagen.
UNMANNED GEOPHYSICAL OBSERVATORY AT NORD IN NORTH GREENLAND.
L. Kristensen, and J. Taagholt. 1973, 82p ISBN-87-7478-073-5

Descriptors: *Greenland, *Meteorological instruments, *Weather stations, Climatology, Data processing, Meteorological parameters.

For abstract, see STAR 1118

N73-27539/8GA PC$17.75/MF$1.45
Japan Meteorological Agency, Tokyo.
AEROLOGICAL DATA OF JAPAN, SEPTEMBER 1972.
1973, 313p

Descriptors: *Aerology, *Japan, *Lower atmosphere, *Meteorological parameters, *Upper atmosphere, Balloon sounding, Rocket sounding, Tables (Data), Troposphere.

For abstract, see STAR 1118

N73-27540/6GA PC$18.00/MF$1.45
Japan Meteorological Agency, Tokyo.
AEROLOGICAL DATA OF JAPAN, AUGUST 1972.
1972, 317p

Descriptors: *Aerology, *Japan, *Lower atmosphere, *Meteorological parameters, *Upper atmosphere, Balloon sounding, Rocket sounding, Tables (Data), Troposphere.

For abstract, see STAR 1118

N73-27541/4GA PC$17.75/MF$1.45
Japan Meteorological Agency, Tokyo.
AEROLOGICAL DATA OF JAPAN, OCTOBER 1972.
1973, 311p

Descriptors: *Aerology, *Japan, *Lower atmosphere, *Meteorological parameters, *Upper atmosphere, Balloon sounding, Rocket sounding, Tables (Data), Troposphere.

For abstract, see STAR 1118

N73-27543/0GA PC$9.00/MF$1.45
Pakistan Space and Upper Atmosphere Research Committee, Karachi.
DATA REPORT: HIGH ALTITUDE METEOROLOGICAL DATA, 1964 - 1970.
Oct 71, 139p W-119

Descriptors: *Meteorological parameters, *Pakistan, *Rocket sounding, *Upper atmosphere, Graphs (Charts), Judi-dart rocket, Tables (Data), Temperature measurement.

For abstract, see STAR 1118

N73-27544/8GA PC$3.00/MF$1.45
Pennsylvania State Univ., University Park.
VARIATION OF THE LOW LEVEL WINDS DURING THE PASSAGE OF A THUNDERSTORM GUST FRONT.
Technical Report, Jan. - Nov. 1972.
R. W. Sinclair, R. A. Anthes, and H. A. Panofsky. Jul 73, 73p NASA-CR-2289
Contract NAS8-27334

Descriptors: *Meteorological parameters, *Thunderstorms, *Wind (Meteorology), *Wind profiles, *Wind velocity, Ground wind, Prediction analysis techniques, Vertical distribution, Wind shear, Wind variations.

For abstract, see STAR 1118

N73-27546/3GA PC$8.00/MF$1.45
Environmental Research and Technology, Inc., Lexington, Mass.
USE OF 4-D ATMOSPHERIC MODELS IN THE SIMULATION OF RADIOMETRIC MEASUREMENTS.
D. T. Chang, and M. G. Fowler. Jul 73, 116p
NASA-CR-129007, P-417
Contract NAS8-28720

Descriptors: *Climatology, *Infrared radiation, *Precipitation (Meteorology), *Radiometers, *Water vapor, Atmospheric models, Atmospheric moisture, Atmospheric windows.

For abstract, see STAR 1118

N73-28050/5GA PC$16.75/MF$1.45
Cramer (H.E.) Co., Inc., Salt Lake City, Utah.
NASA/MSFC MULTILAYER DIFFUSION MODELS AND COMPUTER PROGRAM FOR OPERATIONAL PREDICTION OF TOXIC FUEL HAZARDS.
R. K. Dumbauld, J. R. Bjorklund, and J. F. Bowers. Jun 73, 293p NASA-CR-129006

Contract NAS8-29033

Descriptors: *Atmospheric diffusion, *Computer programs, *Operational hazards, *Rocket launching, Exhaust gases, Meteorological parameters, Toxicity and safety hazard.

For abstract, see STAR 1119

N73-28174/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DISPERSION OF TURBOJET ENGINE EXHAUST IN FLIGHT.
J. D. Holdeman. Aug 73, 23p NASA-TN-D-7382, E-7479

Descriptors: *Atmospheric diffusion, *Jet exhaust, *Turbojet engines, Air pollution, Aircraft wakes, Exhaust gases, Mathematical models, Plumes.

For abstract, see STAR 1119

N73-28436/6GA PC$3.75/MF$1.45
Consiglio Nazional delle Ricerche, Bologna (Italy). Ist. di Fisica dell'Atmosfera.
THE BUDRIO STATION OF THE METEOROLOGICAL RADAR SYSTEM FOR THE SYSTEMATIC STUDY OF THE UPPER ATMOSPHERE.
F. Verniani, G. Sinigaglia, M. Schaffner, S. Gottardi, and C. Franceschi. Mar 73, 34p IFA-CP-289
In Italian; English Summary.

Descriptors: *Meteorological radar, *Weather stations, Networks, Radar equipment, Synoptic meteorology, Upper atmosphere.

For abstract, see STAR 1119

N73-28623/9GA PC$3.50/MF$1.45
Stockholm Univ. (Sweden). Inst. of Meteorology.
THEORETICAL AND PRACTICAL PROBLEMS IN FORMULATING BOUNDARY CONDITIONS FOR A LIMITED-AREA MODEL.
A. Sundstroem. May 73, 26p DM-9
Conf-Presented at the Wmo/Iamap Symp. On Mesoscale Meteorol. Systems and Fine-Mesh Modelling, Reading, Engl., 14-18 May 1973.

Descriptors: *Baroclinity, *Barotropism, *Boundary value problems, *Numerical weather forecasting, Atmospheric models, Finite difference theory, Truncation errors.

For abstract, see STAR 1119

PATENT-3 706 938/GA Not available NTIS
Office of the Secretary of the Army Washington D C
DIRECTIONAL ION ANEMOMETER.
Patent,
Filed 10 Mar 71, patented 19 Dec 72, 5p Rept nos. PAT-APPL-122 895,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Anemometers, *Patents), Electrodes, Alpha decay, Ionization, Wind, Velocity, Measurement.
Identifiers: PAT-CL-324-33, *Ion anemometers, *Wind velocity.

The patent relates to anemometers and particularly to ion anemometers. More particularly, this disclosure relates to a directional, ion anemometer where an alpha nuclear radiation source is positioned between two electrodes of opposing polarity in a balanced electrical field. The ion cloud concentration generated by the radiation source is changed by motion of the air to cause a differential voltage or current, between the source and the electrodes, proportional to the wind velocity.

PB-223 387/2GA PC$5.50/MF$1.45
Washington Univ., Seattle. Div. of Marine Resources.
ARCTIC ICE DYNAMICS JOINT EXPERIMENT. AIDJEX BULLETIN.
Jul 73, 208p AIDJEX-Bull-21, AIDJEX-73-21
Grant NSF-C625
See also AIDJEX-Bull-20, PB-222 057.

Descriptors: (*Atmosphere models, Polar atmospheres), (*Sea ice, Air water interactions), Arctic regions, Atmospheric circulation, Turbulent boundary layer, Pack ice, Equations of motion, Mathematical models.
Identifiers: Planetary boundary layer, Finite element analysis.

Bulletin No. 21 deals mainly with continuing work on modeling the arctic ice cover and atmosphere. It contains papers dealing with such subjects as two-dimensional stress and strain-rate in a floating ice cover, the thickness distribution of sea ice, steady drift of an incompressible arctic ice cover, mesoscale strain in sea ice, and a method for calculating boundary stress in an atmospheric boundary layer. Further work in remote-sensed data analysis is also discussed, in particular sonar mapping of the underside of sea ice and determining pressure ridge frequency distributions from laser data. Two items of special interest are an index of all pictorial data in the AIDJEX Data Bank and a list of all AIDJEX Bulletins now available from NTIS.

PB-223 523/2GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
ECONOMICAL CONVERSION OF A MINIATURE NET RADIOMETER TO AN ALL-WAVE HEMISPHERIC RADIOMETER.
Forest Service research note (Final),
James M. Brown. Dec 71, 3p FSRN-NC-123

Descriptors: (*Radiometers, Revisions), Solar radiation, Atmospheric radiation, Meteorological instruments, Microclimatology.
Identifiers: Modification.

The report describes a method of inexpensively converting a miniature net radiometer to an all-wave hemispheric radiometer that does not preclude the original use of the instrument. (Author)

UCRL-51336/GA PC$7.60/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
FIRST ANNUAL REPORT, DOT-CIAP PROGRAM.
M. C. MacCracken. 13 Feb 73, 220p
Contract W-7405-eng-48

Descriptors: Aircraft, Climates, Earth planet, Equilibrium, Stratosphere, Supersonic transport, Variations.

For abstract, see NSA 28 02, number 05074.

UCRL-74679/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
DISPERISON OF EXHAUST PLUMES IN THE STRATOSPHERE.
J. J. Walton. 2 Apr 73, 7p CONF-730614-3

Descriptors: (*Aircraft, Air pollution), (*Air pollution, *Stratosphere), Diffusion, Plumes.

For abstract, see NSA 28 03, number 07814.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-767 306/4GA PC$13.25/MF$1.45
Naval Underwater Systems Center Newport R I
PROGRAM AND FINANCIAL MANAGEMENT PLAN, RESOURCES INFORMATION SYSTEMS. VOLUME IV. NUSC PERT/TIME/COST PROGRAM USER'S MANUAL.
Technical document,
Richard G. Turlington. 9 Aug 73, 223p Rept no. NUSC-TD-4627

Descriptors: (*Navy, Management planning), (*Data processing systems, Information retrieval), (*Computer programs, Instruction manuals), Costs, Manpower, Time studies, Control sequences, Scheduling, Interfaces.
Identifiers: *Financial management, *PERT, *Management information systems, COBOL, Accounting.

The user's manual contains information to aid in creating input data, selecting output, and interpreting reports related to the Naval Underwater Systems Center PERT Time/Cost Program. (Author)

AD-767 348/6GA PC$3.50/MF$1.45
Army War Coll Carlisle Barracks Pa
INFLUENCE--POWER--AUTHORITY.
Monograph,
Billy J. Mendheim. 20 Mar 72, 28p

Descriptors: (*Management engineering, Reviews), Efficiency, Power, Behavior, Motivation.

A manager must be cognizant of the factors that affect the behavior of his subordinates in order that effective management is ensured. The monograph attempts to present the definitions, associations, and differences of three of these factors--influence, power, and authority. (Modified author abstract)

AD-767 360/1GA PC$3.50/MF$1.45
Army War Coll Carlisle Barracks Pa
A COMPARISON OF MANAGERIAL PROBLEMS IN BUSINESS ORGANIZATIONS AND IN MILITARY ORGANIZATIONS.
Monograph,
Alonzo S. Kretzer. 4 Feb 72, 27p

Descriptors: (*Military organizations, Management engineering), Reviews, Management planning, Management control systems.

The monograph examines some of the managerial problem areas in business and military organizations to determine if there are basic similarities or wide differences within these problem areas. Four general areas are discussed--planning, organizing, directing, and controlling. Data was gathered using a literature search. (Modified author abstract)

COM-73-11589/9GA Reprint
Wisconsin Univ., Milwaukee. Center for Great Lakes Studies.
THE MODERN CHALLENGE TO PORT MANAGEMENT,
Harry C. Brockel. 1971, 8p WIS-SG-72-321
NOAA-73070205
Pub. in Proceedings of International Association of Ports and Harbors Conference (7th), Montreal, Canada, Jun 71 8p.

Descriptors: (*Seaports, *Management), (*Coasts, Development), Economic factors, Leadership, Environmental engineering, Regional planning, Forecasting, Executives, Proceedings.
Identifiers: Sea Grant program.

The author presents a statement on port management in a new era of complexity and challenge with considerations of the economics, environment and adaptation involved in decision making. He emphasizes that the future calls for new high levels of leadership and competence, not only at the top managerial level, but with competent professionals in every aspect of port development.

N73-27873/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SPACE AGE MANAGEMENT FOR SOCIAL PROBLEMS.
A. L. Levine. Apr 73, 20p NASA-TM-X-66296, X-630-73-169
Subm-Submitted for Publication. Conf-Presented at Ann. Conf., AM. Soc. For Public Admin., Los Angeles, 1973.

Descriptors: *Delaware, *Management planning, *New york, Nasa programs, Sociology.

For abstract, see STAR 1118

N73-28937/3GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE PROJECT MANAGEMENT ROLE IN SAFETY.
R. C. Callaway. 20 Jul 73, 28p NASA-TM-X-64764

Descriptors: *Management methods, *Project management, *Safety devices, *Safety management, Management planning, Systems engineering.

For abstract, see STAR 1119

ORNL-NSIC-108/GA PC$15.00/MF$1.45
Oak Ridge National Lab., Tenn.
PERSONNEL INVOLVED IN THE DEVELOPMENT OF NUCLEAR STANDARDS IN THE UNITED STATES, 1972.
J. P. Blakely. May 73, 478p

Descriptors: (*Safety standards, *Personnel), (*Radiation protection, Safety standards), Safeguard regulations.

For abstract, see NSA 28 03, number 07206.

PB-223 617/2GA PC-GPO/MF$1.45-NTIS
National Science Foundation, Washington, D.C. Div. of Science Resources Studies.
AN ANALYSIS OF FEDERAL R AND D FUNDING BY BUDGET FUNCTION.
Final rept. 1960-1972.
Jul 71, 210p NSF-71-25
Paper copy available from GPO $2.50 as NSI.22:F96/963.71.

Descriptors: (*Research, *Federal budgets), (*Resources, Development), Reviews, Trends, Financing, National defense, Income, Public health, Natural resources, Commerce, Transportation, Benefit plans, Services, Education, Manpower utilization, International relations, Agriculture, Rural areas, Government, Community development, Residential buildings, Space exploration.
Identifiers: Research and development, Veterans benefits.

The report relates R and D programs to total federal outlays by budget functions to help in the analysis of R and D priorities. Data from the Office of Management and Budget show that between 1960 and 1972 the chief areas of federal R and D support have been national defense, space research and technology, and health. These functions were expected to make up 86% of the Federal R and D total in 1972, as compared with 95% in 1960. Chief growth areas are commerce and transportation, education and manpower, natural resources, health, agriculture and rural development, and community development and housing.

PB-223 645/3GA PC$7.00/MF$1.45
Southern Research Inst., Birmingham, Ala.
IMPLEMENTATION AND IMPACT OF CONSOLIDATION OF LOCAL GOVERNMENT IN MADISON COUNTY, ALABAMA.
Final rept.
27 Aug 73, 98p SORI-EAS-73-286 CPA-AL-04-09-1029-IIC
Supplement to PB-222 884. Prepared in cooperation with Madison County Local Government Study Commission, Huntsville, Ala.

Descriptors: (*Local government, *Alabama), (*Schools, Consolidation), (*Public administration, Improvement), Organizations, Government policies, Impact, Criteria, Legislation, Personnel, Taxes, Management.
Identifiers: Madison County(Alabama).

Techniques for implementing consolidation of the school systems and of overall local government are investigated and the impact of such consolidations is set forth, especially in the light of particular criteria. Opportunities for a more rational government structure involve district-based designation of legislative council members, separation of legislative and executive functions, reliance on a strong mayor or manager, budgetary accountability of all functions and independent boards to a single county council, use of a second tier of local municipal councils throughout the county, establishment of three tax-service districts, decreased reliance on ad valorem taxes, and increased reliance on sales and occupational taxes.

UCC-ND-246/GA PC$4.00/MF$1.45
Union Carbide Corp., Oak Ridge, Tenn. Nuclear Div.
MINORITY PRE-CO-OP PROGRAM FOR HIGH SCHOOL GRADUATES.
May 73, 37p

Descriptors: (*Personnel, *Education).

For abstract, see NSA 28 03, number 07624.

5B. Documentation and Information Technology

AD-767 051/6GA PC$5.25/MF$1.45
Technology Reports Centre Orpington (England)
TRC TOPICS. STANDARD TOPICS. VOLUME 73, NUMBER 8.
1973, 65p
See also AD-767 052.

Descriptors: (*Scientific research, Abstracts), Great Britain, Reports, Aeronautics, Lubricants, Bearings, Control systems, Alloys, Cost effectiveness, Accidents, Air pollution, Water pollution, Economics, Meteorology, Communication systems, Data transmission systems, Mathematics, Medicine.

The bibliography is comprised of abstracts of reports in the National Technical Information Service data base. The following topics are included: V/STOL aircraft; fluidics; automatic control; friction, wear, lubrication, bearings and gears; titanium alloys; nondestructive tests; cost effectiveness; holography; pressure vessels; accidents; joints, joining and welding; water pollution; air pollution; time series; economic forecasting; meteorological statistics; industrial injury statistics; reliability; noise in communication systems; multivariate analysis; statistical distribution theory; marine technology; genetics; communication satellites; data transmission and computer networks; medical statistics.

AD-767 052/4GA PC$4.50/MF$1.45
Technology Reports Centre Orpington (England)
TRC TOPICS. STANDARD TOPICS, VOLUME 73, NUMBER 9.
1973, 50p
See also AD-767 051.

Descriptors: (*Scientific research, Abstracts), Great Britain, Reports, Aeronautics, Lubricants, Bearings, Control systems, Alloys, Cost effectiveness, Accidents, Air pollution, Water pollution, Economics, Meteorology, Communication systems, Data transmission systems, Mathematics, Medicine.

The bibliography is comprised of abstracts of reports in the National Technical Information Service data base. The following topics are included: V/STOL aircraft; fluidics; automatic control; friction, wear, lubrication, bearings and gears; titanium alloys; nondestructive tests; cost effectiveness; holography; pressure vessels; accidents; joints, joining and welding; water pollution; air pollution; time series; economic forecasting; meteorological statistics; industrial injury statistics; reliability; noise in communication systems; multivariate analysis; statistical distribution theory; marine technology; genetics; communication satellites; data transmission and computer networks; medical statistics.

CONF-730423-3/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
POLLUTION, PRODUCTION, AND COMPENSATION.
C. H. Patrick. 1972, 15p

Descriptors: (*Pollution, *Control), (*Coal, *Pollution regulations), Environment.

For abstract, see NSA 28 03, number 07687.

ED-077 513/GA Not available NTIS
Wisconsin Univ., Milwaukee.
ACQUISITION OF FOREIGN MATERIALS FOR U.S. LIBRARIES,
Theodore Samore. 1973, 370p
Available from: the Scarecrow Press, Inc. 52 Liberty Street, Metuchen, N.J. 08840.

Descriptors: (*Library acquisition, Foreign language books), (*Foreign language books, Library materials), (*Foreign language periodicals, Library collections), (*Library material selection, Federal programs), (*Microforms, Library acquisition).

Major American research and university libraries, and even college and medium to large public libraries, are steadily expanding their acquisition of foreign materials. In view of this development, a two-week institute on the Acquisition of Foreign Materials was held at the University of Wisconsin-Milwaukee in 1971. The basic purpose of the institute was to familiarize the participants with both traditional and newly developed procedures and methods for the acquisition of library materials from foreign countries, thereby strengthening these resources by increasing the efficiency of the acquisition process institutionally and nationally. The objectives were to: identify and discuss techniques, procedures and problems to the acquisition of various kinds of foreign materials by all types of libraries; acquaint participants with ongoing cooperative acquisitions programs, and explore additional possibilities; discuss the problems relating to special materials; and, to examine and evaluate the latest methods of acquiring current and non-current foreign materials. The 38 papers given at the institute are grouped under the following headings: Cooperative and Federal acquisition programs; sources of foreign materials: gifts and

exchanges, bookdealers, auctions; acquisition programs in specific areas; and the acquisition of special materials. (Author/SJ)

JuL-Bibl.-17/GA PC$28.50/MF$1.45
Kernforschungsanlage, Juelich (West Germany).
LITERATURE SOURCES FOR PURE AND APPLIED SCIENCE.
Nov 72, 530p
In German. U.S. Sales Only.

Descriptors: (*Kernforschungsanlage juelich, *Information retrieval), Bibliographies.

For abstract, see NSA 28 02, number 04970.

NP-19647/GA PC$4.00/MF$1.45
International Atomic Energy Agency, Vienna (Austria).
REPORT ON THIRD SERIES OF MEETINGS, STANDING COMMITTEE ON CIVIL LIABILITY FOR NUCLEAR DAMAGE, VIENNA, 1--4 JUNE 1971.
15 Sep 72, 20p CN-12/SC/20
U.S. Sales Only.

Descriptors: Civil liability, Meetings, Radiation effects, Radioisotopes.

For abstract, see NSA 28 02, number 05046.

N73-27874/9GA PC$6.00/MF$1.45
North Carolina Science and Technology Research Center, Research Triangle Park.
A REGIONAL TECHNOLOGY TRANSFER PROGRAM.
Final Report, 1 Nov. 1971 - 31 Oct. 1972.
P. J. Chenery. 31 Oct 72, 79p NASA-CR-133301
Contract NASW-2320

Descriptors: *Technology transfer, *Technology utilization, Information dissemination, Information systems, Libraries.

For abstract, see STAR 1118

N73-28553/8GA PC$7.75/MF$1.45
Defence Research Establishment Valcartier (Quebec).
RESEARCH PROGRESS IN TEA LASERS, SURVEILLANCE TECHNIQUES, BALLISTICS TESTS, AND COMPUTER PROGRAMS FOR GUN DESIGN.
Annual Report, 1972.
1972, 115p DREV-692/73
Misc-Original Contains Color Illustrations.
In English and French.

Descriptors: *Canada, *Military technology, *Research and development, Carbon dioxide lasers, Explosives, Patents, Propellants, Systems analysis.

For abstract, see STAR 1119

N73-28941/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
INDEX TO NASA TECH BRIEFS, 1972.
Feb 73, 202p NASA-SP-5021(13)

Descriptors: *Indexes (Documentation), *Technology utilization, Abstracts, Research and development, Technology transfer.

For abstract, see STAR 1119

PB-222 149/7GA PC$2.75/MF$1.45
Agency for International Development, Washington, D.C.
A.I.D. RESEARCH ABSTRACTS, VOLUME 1, NUMBER 1, JULY 73.
Bibliography.
Jul 73, 23p

Descriptors: (*Economic development, *Developing countries), Research, Abstracts, Social sciences, Economics, Public administration, Education, Commerce, Medicine, Engineering, Agriculture, Food, Construction, Manufacturing, Urban planning.

The quarterly publication contains abstracts of research documents relevent to national development and foreign assistance. Subject matter of prime interest are the following: Industrial and urban development; economics; development planning and administration; education; nutrition; health; agriculture including water resources, fisheries, rural development, and agricultural economics; science and technology.

PB-223 496/1GA PC$3.75/MF$1.45
Committee on Scientific and Technical Information, Washington, D.C.
LEGAL ASPECTS OF COMPUTERIZED INFORMATION SYSTEMS.
Rept. for Jan 69-Sep 72.
Sep 72, 98p* COSATI-73-01

Descriptors: (*Information systems, Law(Jurisprudence)), Data processing, Secure communication, Copyrights, Meetings, International relations.
Identifiers: *Computer privacy, National information systems, Antitrust policies.

COSATI established a Panel on Legal Aspects of Information Systems to identify and consider the legal issues affecting the development of national scientific and technical information systems and to present findings and recommendations to COSATI. The report concentrates on seven issues: Right of entry and access to information systems; Freedom of Information Act; right of privacy; anti-trust issues; property rights; copyright issues in the U.S.; international copyright situation. Over 50 national authorities consulted and the issues were presented for discussion at COSATI sponsored Symposium on Legal Aspects of Computerized Information Systems June 22-23, 1972 in Washington, D.C. The report combines revised versions of the symposium presentations and views of symposium participants.

PB-223 619/8GA PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
ON THE SPECIFICATION OF TERM VALUES IN AUTOMATIC INDEXING.
Technical rept.,
G. Salton, and C. S. Yang. Jun 73, 36p CU-CSD-73-173

Descriptors: (*Automatic indexing, *Subject index terms), Subject indexing, Information retrieval effectiveness.
Identifiers: *Weighted subject index terms, Word frequency, Weighting(Documentation).

The existing practice in automatic indexing is reviewed, and it is shown that the standard theories for the specification of term values (or weights) are not adequate. New techniques are introduced for the assignment of weights to index terms, based on the characteristics of individual document collections. The effectiveness of some of the proposed methods is evaluated. (Author)

PB-223 649/5GA PC$5.25/MF$1.45
Agency for International Development, Washington, D.C.
A. I. D. MEMORY DOCUMENTS: RESEARCH 1962-1972, RESEARCH VOLUME A.
Jul 73, 199p

Descriptors: (*Economic development, *Developing countries), Research, Bibliographies, Social sciences, Political science, Economics, Public administration, Education, Commerce, Botany, Medicine, Engineering, Agriculture, Food, Manufacturing.

A listing is given of research documents that have been produced with A. I. D. financing from 1962-to July 1972.

PB-223 733/7GA PC$3.00/MF$1.45
Transportation Systems Center, Cambridge, Mass.
GUIDELINES FOR WRITING RAILROAD OPERATING RULES.
Technical rept.,
Donald B. Devoe, and Anne W. Story. Jul 73, 27p
DOT-TSC-FRA-73-7 FRA-RT-74-1

Descriptors: (*Railroad trains, Regulations), (*Regulations, *Writing), Operations, Management planning, Revisions, Nomenclature, Semantics, Criteria, Definitions, Manuals, Phrase structure grammars, Graphic methods, Statistical data, Railroads.
Identifiers: Style, Sentence structure.

The report constitutes an aid to persons or groups who must create or revise railroad operating rules. It provides guidance for avoiding confusion, ambiguity and misconceptions in the wording of rules. Content, style and organization are discussed, with illustrations of both desirable and undesirable practices taken from current codes of operating rules.

PB-223 777/4GA PC$14.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
THEORY OF INDEXING AND CLASSIFICATION.
Doctoral thesis,
Clement Tak Yu. Aug 73, 237p CU-CSD-73-181
Grant NSF-GN-27224, NSF-GJ-33171

Descriptors: (*Subject indexing, Statistical analysis), (*Classifications, Subject index terms), Coordinate indexing, Automatic indexing, Clustering, Clumps, Information retrieval, Theses.
Identifiers: *Weighted subject index terms, Weighting(Documentation).

The dissertation deals with the problems of document content analysis (indexing), the classification of index terms, and the grouping (clustering) of documents. The purpose of the work is to improve systems effectiveness and systems efficiency.

TID-26162/GA PC$3.00/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
"MAY THE ATOM..." A REPORT OF THE U.S. ATOMIC ENERGY COMMISSION DELEGATION TO THE U.S.S.R., AUGUST 1971.
J. Lewin. Oct 72, 216p

Descriptors: (*Us aec, *International cooperation), (*Ussr, International cooperation), Accelerators, Energy storage, International organizations, Management, Meetings, Nuclear power, Reactors, Stable isotopes.

For abstract, see NSA 28 03, number 07621.

TID-4579-R7/GA PC$10.60/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
SERIAL TITLES CITED IN NUCLEAR SCIENCE ABSTRACTS.
Mar 73, 472p

Descriptors: Information, Information systems, Us aec.

For abstract, see NSA 28 02, number 05072.

5C. Economics

AD-767 395/7GA PC-GPO/MF$1.45-NTIS
American Univ Washington D C Foreign Area Studies

AREA HANDBOOK FOR AFGHANISTAN,
Harvey H. Smith, Donald W. Bernier, Frederica M. Bunge, Frances Chadwick Rintz, and Rinn-Sup Shinn. 1973, 495p DA-PAM-550-65
Library of Congress catalog card no. 73-600084. Supersedes report dated Feb 69, AD-685 515.
Availability: Paper copy available from GPO $4.35 as D.101.22:550-65.

Descriptors: (*Afghanistan, *Handbooks), Economics, Political science, Sociology, Communication systems, Transportation, Foreign aid, Armed forces(Foreign).
Identifiers: Area studies.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

CEA-R-4438/GA PC$3.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
NEW METHOD FOR QUANTIFYING THE VALUE OF INNOVATIONS.
L. Thiriet. Feb 73, 35p
In French. U.S. Sales Only.

Descriptors: (*Research programs, *Market), Economics, Monte carlo method, Probability, Statistics.

For abstract, see NSA 28 03, number 07676.

COM-72-50965-26/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME III, NUMBER 26.
1 Oct 73, 76p
Paper copy available from GPO $33.00/year as C1.58:3, $1.50/copy as C1.58:3/26.

Descriptors: (*Commerce, Reviews), International trade, Research.

Contents:
- Economic highlights;
- Trade at world level gains sharply in 1973;
- Corporation leaders respond with action on minority effort;
- Government applies management approach to aid business services;
- Domestic business report;
- International commerce report.

COM-73-10120/GA PC-NTIS/MF$1.45/copy
International Customs Tariffs Bureau, Brussels (Belgium).
INTERNATIONAL CUSTOMS JOURNAL. YEAR 1972-1973
Bulletins.
1972-73approx. 50 issues annually

The reports present authoritative information for exporters, importers, investors, manufacturers, and those concerned with international trade. They contain the schedules of duties and exemptions applicable to goods imported into or exported from the country. Order by individual number listed below:
- Bull-191. Austria. 7th ed, suppl-1, Jul 73, 4p, suppl. to COM-72-10620-191, $2.75

COM-73-11500/8GA PC$7.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
ENERGY AND DEVELOPMENT: A CASE STUDY,
William W. Seifert, Mohammed A. Bakr, and M. Ali Kettani. 1973, 305p MITSG-72-16, MIT-25
NOAA-73082812
Contract NOAA-2-35150

Descriptors: (*Saudi Arabia, *Economic development), Electric power generation, Natural gas, Dams, Minerals, Natural resources, Economics, Geography, Petrochemistry, Reclamation, Fertilizers, Phosphates, Hydroelectric power generation, Aquaculture, Desalting, Geography.
Identifiers: Sea Grant Program, Bahrain Gulf, Agroindustrial complexes.

This study examines the economic and technical possibilities of two major programs which appear to offer considerable potential for development of the Western region of Saudi Arabia. One project explored the possibility of establishing an agroindustrial complex based upon natural gas, the other dealt with the possibility of constructing a dam across the mouth of the Gulf of Bahrain and using the difference in water level resulting from evaporation behind the dam to generate electric power. In addition to this heliohydroelectric power generation it is proposed that minerals be recovered from the concentrated brine in the Gulf.

COM-73-50182/GA PC-GPO/MF$1.45-NTIS/copy
Bureau of International Commerce, Washington, D.C.
OVERSEAS BUSINESS REPORTS.
Herbert A. Lindow. 1973-74,approx. 110 issues
Paper copy available from GPO $28.50/year as C1.50:73, $0.30/copy.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:
- OBR-73-42. Selling in Peru. Sep 73, 16p
- OBR-73-43. Selling in Australia. Sep 73, 16p
- OBR-73-44. United States Trade with Major World Areas 1967-1972. Aug 73, 68p
- OBR-73-45. Market Profiles for the Caribbean. Sep 73, 12p
- OBR-73-46. United States Trade with Major Trading Partners 1967-1972. Sep 73, 40p
- OBR-73-47. Market Profiles for Mexico, Central America and Panama. Oct 73, 8p

COM-73-50185/GA PC$0.25/copy
Bureau of International Commerce, Washington, D.C.
FOREIGN ECONOMIC TRENDS AND THEIR IMPLICATIONS FOR THE UNITED STATES.
1973,147 issues
Paper copy available from GPO $27.00/year as C42.30.

The series of reports presents current business and economic developments in every country that offers a present or potential market for United States goods. The reports include a summary of the prospective impact on the United States economy, changing trade patterns prospective business trends, balance of payments, government policies, and investments. For individual country reports, order by COM-number listed below:
- ET-73-089. Senegal. Annual rept. 1 Aug 73, 12p, supersedes ET-72-077.
- ET-73-090. Sweden. Semiannual rept. 17 Aug 73, 11p, supersedes ET-73-014.
- ET-73-091. Turkey. Semiannual rept. 6 Aug 73, 11p, supersedes ET-72-128.
- ET-73-092. Rwanda. Annual rept. 10 Aug 73, 8p, supersedes ET-72-057
- ET-73-093. Venezuela. Semiannual rept. 16 Aug 73, 23p, supersedes ET-73-018
- ET-73-094. Jamaica. Annual rept. 7 Aug 73, 11p, supersedes ET-72-081
- ET-73-096. Haiti. Annual rept. 10 Aug 73, 7p, supersedes ET-72-091
- ET-73-097. Sierra Leone. Annual rept. 16 Aug 73, 8p, supersedes ET-72-088
- ET-73-098. Turks and Caicos Islands. Annual rept. 16 Aug 73, 11p, supersedes ET-72-078

CONF-730423-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
REGIONAL DIFFERENCES IN THE GROWTH OF OVERNIGHT TRUCK TRANSPORT MARKET AREAS, 1950--1970.
R. J. Olsen, and G. W. Westley.

Descriptors: (*Market, *Economics), (*Regional analysis, Market), Transport.

For abstract, see NSA 28 03, number 07686.

CONF-730426-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
REGIONAL DIFFERENCES IN THE GROWTH OF MARKET POTENTIALS, 1950--1970.
R. J. Olsen, and G. W. Westley.

Descriptors: (*Market, *Economics), (*Regional analysis, Market), Transport.

For abstract, see NSA 28 03, number 07688.

N73-27815/2GA PC$5.25/MF$1.45
Defence Research Analysis Establishment, Ottawa (Ontario).
THE DEFENCE PROGRAM AND NATIONAL INDUSTRIAL DEVELOPMENT (A BACKGROUND PAPER FOR DEFENCE PLANNERS).
C. F. W. Pound.

Descriptors: *Canada, *Environment effects, *Industrial management, *Production engineering, Economics, Policies, Regional planning, Social factors.

For abstract, see STAR 1118

N73-28943/1GA PC$6.50/MF$1.45
IIT Research Inst., Chicago, Ill. Management and Social Science Research.
TECHNOLOGY TRANSFER TO A DEVELOPING NATION, KOREA.
Final Report.
C. A. Stone, and S. J. Uccetta.
Contract NASW-2083

Descriptors: *Korea, *Manufacturing, *Technology transfer, Industries, Methodology, Problem solving, Research and development.

For abstract, see STAR 1119

PB-223 624/8GA PC$6.25/MF$1.45
Institute for the Future, Menlo Park, Calif.
SOME CONSIDERATIONS CONCERNING BANKRUPTCY REFORM.
Final rept.,
Selwyn Enzer, Raul de Brigard, and Frederick D. Lazar. Mar 73, 274p* R-28 NSF-RA/S-73-001
National Science Foundation.

Descriptors: (*Financial management, Failure), (*Commercial law, Revisions), Interviews, Executives, Professional personnel, Credit, Statistical distributions, Classifications, Opinions, Questionnaires, Recommendations.
Identifiers: Bankruptcy, Insolvency laws, Wage earner bankrupts, Delphi technique.

The report presents the results of a study on the bankruptcy laws of the United States. The material was obtained from a panel of people familiar with various aspects of the bankruptcy system, includes judges, referees, lawyers, trustees, creditors, bankrupts, and social scientists. The panel presented their perception of the philosophy, goals, problems, and changes in the insolvency laws. The impact that possible future social conditions might have on the suggested changes was included.

PB-223 667/7GA PC$8.25/MF$1.45
Charles River Associates, Inc., Cambridge, Mass.
THE ECONOMIC IMPACT OF PUBLIC POLICY ON THE APPALACHIAN COAL INDUSTRY AND THE REGIONAL ECONOMY. VOLUME I. PROFILE OF THE APPALACHIAN COAL INDUSTRY AND ITS COMPETITIVE FUELS.
Final rept.
Jan 73, 422p* CRA-173-21 ARC-72-13-1
Paper copy also available from NTIS $23.00/set of 3 reports as PB-223 666-SET.

Descriptors: (*Coal mining, *Appalachia), (*Economic forecasting, Coal mining), Demand(Economics), Economic factors, Government policies, Employment, Utilization, Cost analysis, Economic models, Reserves, Statistical distributions, Classifications, Substitutes, Strip mining, Competition, Supply(Economics).
Identifiers: *Coal industry, Economic impact.

The report analyzes the nature of the demand for coal and forecasts the level of demand by geographic market and end use category to 1980. It analyzes the distribution of production costs among various types and sizes of mines, the availability of reserves and the characteristics of those reserves. The costs of various public policies to the producer and/or consumer are estimated. A basic forecast of 1980 supply/demand relationships by market and end use is then adjusted to reflect the impact of alternative public policies, including those that might affect the costs of alternative fuels.

PB-223 668/5GA PC$9.75/MF$1.45
Charles River Associates, Inc., Cambridge, Mass.
THE ECONOMIC IMPACT OF PUBLIC POLICY ON THE APPALACHIAN COAL INDUSTRY AND THE REGIONAL ECONOMY. VOLUME II. IMPACT OF ENVIRONMENTAL AND OTHER POLICIES ON THE APPALACHIAN COAL INDUSTRY.
Final rept.
Jan 73, 511p* CRA-173-22 ARC-72-13-2
Paper copy also available from NTIS $23.00/set of 3 reports as PB-223 666-SET.

Descriptors: (*Coal mining, *Appalachia), (*Government policies, Coal mining), Environmental engineering, Processing, Air pollution, Surface minig, Regulations, Strip mining, Water pollution, Mine waters, Pneumoconiosis, Taxes, Statistical data.
Identifiers: Mine acid drainage, Disability, Economic impact.

The second part of a three volume study uses the findings of the industry study in the first part to examine the impact of a range of policy actions on the Appalachian coal industry and on income and employment in the Appalachian region. The principal policies to be analyzed concern air pollution, strip mine reclamation, water pollution, health aspects of the Federal Coal Mine Health and Safety Act, and the economics of various forms of taxation on the coal mining industry.

PB-223 669/3GA PC$7.25/MF$1.45
Charles River Associates, Inc., Cambridge, Mass.
THE ECONOMIC IMPACT OF PUBLIC POLICY ON THE APPALACHIAN COAL INDUSTRY AND THE REGIONAL ECONOMY. VOLUME III. APPENDICES.
Final rept.
Jan 73, 344p* CRA-173-23 ARC-72-13-3
Paper copy also available from NTIS $23.00/set of 3 reports as PB-223 666-SET.

Descriptors: (*Coal mining, *Appalachia), (*Economic analysis, Coal mining), Statistical data, Regions, Bituminous coal, Lignite, Supply(Economics), Classifications, Economic forecasting, Residual oils, Pyrite, Transportation, Cost analysis, Computer programming.
Identifiers: State summaries, Counties.

The third volume in a three volume report contains statistical data appendixes to The Economic Impact of Public Policy on the Appalachian Coal Industry and the Regional Economy. Topics treated include 1970 Appalachian coal production by county, Bituminous coal and lignite distribution: Calendar year 1970, Long-run supply structure by county, 1972, Long-run supply structure by county, 1980 status quo forecasts, and Long-run supply structure by county, 1980. Portions of this document are not fully legible.

PB-223 676/8GA PC$4.00/MF$1.45
National Commission on Materials Policy, Washington, D.C.
COMPENDIUM OF UNIVERSITY FORUMS OF THE NATIONAL COMMISSION ON MATERIALS POLICY, MAY-JUNE, 1972. A BACKGROUND DOCUMENT,
Allen F. Agnew. Jun 73, 38p NCMP-UF-0

Descriptors: (*Natural resources, Meetings), (*Government policies, Natural resources), Summarizing, Materials recovery, Ecology, Economics, International relations, Education, Personnel.
Identifiers: Waste recycling, Technology.

This summary states the purpose and charge to each of the eight university forums of the National Commission on Materials Policy (NCMP), gives a summary of the material presented therein, and refers briefly to the Commission's published report on the forums (Ryan, 1972). One Appendix presents a matrix of specific subjects discussed at each of the forums, another gives a combined list of the 600 participants, and the third presents a matrix table of contents for each of the eight forums.

PB-223 677/6GA PC$9.50/MF$1.45
National Commission on Materials Policy, Washington, D.C.
COMPENDIUM OF UNIVERSITY FORUMS OF THE NATIONAL COMMISSION ON MATERIALS POLICY, MAY-JUNE, 1972. NATIONAL MATERIALS POLICY COMMISSION UNIVERSITY FORUM, COLORADO SCHOOL OF MINES ON 22-24 MAY 1972,
Allen F. Agnew. Aug 73, 146p NCMP-UF-2

Descriptors: (*Natural resources, Meetings), (*Government policies, Natural resources), Metalliferous minerals, Non metalliferous minerals, Land use, Mineral economics, Supply(Economics), Education, Pollution, South America, International relations, Law(Jurisprudence).

The Colorado School of Mines Forum stressed primary metal and nonmetal commodities. It considered educational elements such as the development of new technology and the education of technical professionals. Environmental policy affecting the minerals industry was discussed; land-use law and mineral law, and international policies made up the rest of the program.

PB-223 678/4GA PC$38.75/MF$1.45
National Commission on Materials Policy, Washington, D.C.
COMPENDIUM OF UNIVERSITY FORUMS OF THE NATIONAL COMMISSION ON MATERIALS POLICY, MAY-JUNE 1972. A BACKGROUND DOCUMENT. UNIVERSITY FORUM ON NATIONAL MATERIALS POLICY, MASSACHUSETTS INST. OF TECH. ON 30 MAY-2 JUN 197 2,
Allen F. Agnew. Aug 73, 733p NCMP-UF-3

Descriptors: (*Natural resources, Meetings), (*Government policies, Natural resources), Mineral deposits, Coal gasification, Energy, Fuels, Electric devices, Metals, Human ecology, Materials recovery, Education, Supply(Economics), Demand(Economics).
Identifiers: Waste recycling.

The Massachusetts Institute of Technology Forum covered six subjects: materials problems in energy conversion, research in advanced materials; national policy on resources, waste recycling, and education, and a national materials policy. Specialty metals, coal conversion, electronic materials, aerospace structural materials, biomaterials, and polymeric materials were all considered in depth, as were recycling of solid refuse and the effect of recycling on materials supply. Relationships to man were examined via the topic 'human ecology and compatible technology.'

PB-223 679/2GA PC$13.25/MF$1.45
National Commission on Materials Policy, Washington, D.C.
COMPENDIUM OF UNIVERSITY FORUMS OF THE NATIONAL COMMISSION ON MATERIALS POLICY, MAY-JUNE 1972. A BACKGROUND DOCUMENT. NCMP FORUM ON TECHNOLOGICAL INNOVATION IN THE PRODUCTION AND UTILIZATION OF MATERIALS AT PENNSYLVANIA STATE UNIVERSITY, ON 19-21 JUNE 1972,
Allen F. Agnew. Aug 73, 223p NCMP-UF-6

Descriptors: (*Natural resources, Meetings), (*Government policies, Natural resources), Iron and steel industry, Metallurgy, Coal gasification, Polymers, Ceramics, Electric power generation, Economics, Substitutes.

The Pennsylvania State University Forum discussed, under the general thrust of technological innovation: iron and steel, nonferrous production metallurgy, economics of substitution, polymeric and ceramic materials, coal and synthetic pipeline gas, and the state of the U. S. mineral position.

PB-223 680/0GA PC$10.75/MF$1.45
National Commission on Materials Policy, Washington, D.C.
COMPENDIUM OF UNIVERSITY FORUMS OF THE NATIONAL COMMISSION ON MATERIALS POLICY, MAY-JUNE, 1972. A BACKGROUND DOCUMENT. PROCEEDINGS OF THE GEORGIA TECH. FORUM FOR THE NCMP. TOPICS--MATERIALS DETERIORATING, CONSTRUCT ION MATERIALS, TEXTILES, AND FORESTRY AND FOREST PRODUCTS, OCTOBER 1972,
Allen F. Agnew. Aug 73, 171p NCMP-UF-8

Descriptors: (*Natural resources, Meetings), (*Grovernment policies, Natural resources), Deterioration, Plastics, Materials recovery, Transportation, Construction, Textiles, Wood products, Paper industry, International trade, Land use.

The Georgia Tech. Forum examined the four general topics given in the title by specific consideration of deterioration of synthetic plastics and recycling, transportation and construction materials, nonmetallic minerals of construction, textiles in the USA in the 1980's, forest management and land-use conflicts, use of forest residue, and world import functions for the paper industries.

PB-223 803/8GA PC$9.75/MF$1.45
New Hampshire Univ., Durham. Water Resources Research Center.
THE EFFECTS OF DIMINISHED GROUNDWATER SUPPLIES ON SELECTED NEW HAMPSHIRE INDUSTRIES.
Doctoral thesis,
Robert Henry Forste. Mar 73, 155p OWRR-A-028-NH(1), W73-14766
Contract DI-14-31-0001-3529

Descriptors: (*Water supply, Ground water), (*Industrial water, *Ground water), (*New Hampshire, *Water resources), Expenses, Economic analysis, Water law, Water rights, Equity(Law), Methodology, Industries, Cost estimates, Constraints, Theses, Dairies, Plastics industry.

Identifiers: Ground water mining, Tanneries.

The objectives of this study were to (1) estimate the costs incurred by selected industrial groundwater users if groundwater supply constraints are imposed; (2) outline a methodological framework for the use of courts, industries, and planners to guide decisions on groundwater resource allocations; and (3) assess the impact upon selected industrial groundwater users in the short-run and project long-run adjustments under groundwater supply constraints. Four firms were selected for analysis, representing economically important industries that utilize large quantities of water: a fluid milk plant, a tannery, a wood pulp conversion operation, and a polyurethane fabricator. (Modified author abstract)

5D. History, Law, and Political Science

AD-767 060/7GA PC$2.75/MF$1.45
Michigan Univ Ann Arbor Dept of Political Science
INTERNATIONAL DATA ARCHIVE.
Final rept.,
Raymond Tanter. 14 Sep 73, 8p
Contract N00014-67-A-0181-0041

Descriptors: (*Foreign policy, Reviews), Behavior, Government(Foreign), Interactions, United States government, USSR, China, Petroleum.
Identifiers: International relations.

Three basic analyses were completed: Sino-Soviet interaction analysis; U.S./Soviet intervention analysis; and U.S./Soviet involvement analysis.

AD-767 354/4GA PC$3.75/MF$1.45
Army War Coll Carlisle Barracks Pa
THE SOVIET STAKE IN MUTUAL AND BALANCED FORCE REDUCTIONS.
Student essay,
James M. Peterson. 3 Dec 71, 33p

Descriptors: (*Armed forces(Foreign), *Eastern Europe), (*USSR, Foreign policy), Arms control, Disarmament, Military personnel, Reduction.
Identifiers: NATO.

Moscow's recent initiatives in Mutual and Balanced Force Reductions (MBFR) for Central Europe are probably based on a complex array of political and military factors. These can be illuminated by review of Soviet and Warsaw Treaty Organization overtures on European security and regional arms control measures over the past fifteen years. MBFR negotiations could add impetus to their emerging diplomatic campaigns in Europe and perhaps, in their view, weaken NATO. The Soviets probably do not perceive a military or economic advantage for themselves resulting from an MBFR agreement. Morevover, Moscow probably fears that an MBFR would exacerbate the open desire of a number of her allies to decrease Soviet hegemony in Eastern Europe. The Soviets have remained deliberately vague on the specifics of how to go about talks on MBFR but are probably examining alternatives for approaching negotiations. These dilemmas could favor NATOs range of negotiating points in achieving realistic agreement.

COM-73-11512/3GA PC$3.00/MF$1.45
Texas Law Inst. of Coastal and Marine Resources, Houston.
COMPARATIVE ASPECTS OF COASTAL ZONE MANAGEMENT: BACKGROUND INFORMATION ON THE LAW OF TEXAS AND OTHER STATES IN VIEW OF THE COASTAL ZONE MANAGEMENT ACT OF 1972.
Aug 73, 39p TAMU-SG-73/607 NOAA-73083001
Report on Sea Grant Program.

Descriptors: (*Texas, Law(Jurisprudence)), (*Coasts, *Law(Jurisprudence)), Common law, Statutes, Littoral zone, State government, Beaches.
Identifiers: Sea Grant program, *Coastal zone management.

This monograph provides background common law and statutory law material to aid in the development of a coastal zone management program by showing what Texas already has done. Solutions devised by other states are described. These deal with administrative reorganization; environmental policy act; land use acts; environmental protection acts; site location laws; and wetlands regulations. Appendices set forth the following: State Shorelands and Wetlands Acts; State Laws for Citizens Suits; State Laws Requiring Environmental Impact Statements; Reorganization Laws; Materials on Common Law Remedies; Commentaries on Open Beaches Law; Materials Discussing Statutes; and Texas Law Institute Publications.

PB-223 648/7GA PC$3.00/MF$1.45
Law Enforcement Assistance Administration, Washington, D.C.
NATIONAL SURVEY OF COURT ORGANIZATION, 1971.
Jun 72, 11p

Descriptors: (*Law(Jurisprudence), Organizations), (*State government, Law(Jurisprudence)), (*Local government, Law(Jurisprudence)), Surveys, Statistical data, Classifications, Definitions, Variations, Regions, Identifying, United States.
Identifiers: *Courts of law, Jurisdiction.

The pamphlet is a preliminary report of a survey designed to identify the various divisions, departments, branches, and other subunits of each state's court organization. Findings show that there were 14,163 state and local court systems operating in 16,460 court locations in the United States in 1971. Approximately 87% of all appellate courts, 95% of all courts of general jurisdiction, and 89% of all courts of limited and special jurisdiction exercised some criminal jurisdiction. Included are definitions of the various types of courts centering on the extent and nature of jurisdiction exercised.

PB-223 699/0GA PC$3.50/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
PILOT CITIES PROJECT RESEARCH PLAN -- A PRELIMINARY DESIGN,
Pedro R. David, Fred W. Koehne, and William R. Partridge. Oct 71, 29p CJP-71-4
Grant LEAA-NI-71-050-G

Descriptors: (*Criminal law, *Urban planning), (*Criminology, *Systems management), Projects, Criteria, Methodology, Evaluation, Systems analysis, Objectives, Organizations, Operations, New Mexico, Interactions.
Identifiers: *Pilot cities project.

The project is designed to develop, test, and refine the criteria and methodology by which the overall criminal justice system and its component parts may be evaluated. The fundamental approach involves establishing a set of weighted relationships between criteria for excellence, basic system objectives, and agency activities.

PB-223 701/4GA PC$4.50/MF$1.45
Law Enforcement Assistance Administration, Washington, D.C.
SAFE STREETS--THE LEAA PROGRAM AT WORK.
1971, 47p

Descriptors: (*Law enforcement, *Local government), (*Criminology, *Federal budgets), (*Criminal law, *Community relations), State government, Local government, Project planning, Grants, Prevention, Urban areas, Control, Research, Specialized training, Police, Drug addiction, Juvenile delinquency.
Identifiers: Organized crime, Courts of law.

LEAA is giving state and local communities the resources to improve all facets of law enforcement. With the help of a block planning grant, each state annually draws up a comprehensive law enforcement plan. Block grant funds and discretionary grants have been awarded for strengthening police capabilities, for modernizing courts and court management, for upgrading and reforming corrections, to combat and control organized crime, for prevention and control of civil disorders, for combatting drug abuse, for reducing juvenile delinquency, and for aid to cities in special problem areas such as violent street crimes. How and where to apply for the various grants is given, as well as a listing of the state law enforcement planning agencies and regional offices.

PB-223 782/4GA PC$8.00/MF$1.45
National Park Service, Denver, Colo. Historic Preservation Team.
THE BRITISH SIEGE OF ST. AUGUSTINE IN 1740. CASTILLO DE SAN MARCOS NATIONAL MONUMENT, FLORIDA.
Historic resource study,
Ricardo Torres-Reyes. 10 Mar 72, 117p FNP-PHH-73-142

Descriptors: (*National parks, *History), Monuments, Warfare, Reviews, Bibliographies.
Identifiers: Castillo de San Marcos National Monument, Saint Augustine(Florida).

The report deals with a single significant episode in Colonial America arising from the threat Spanish settlements posed to English colonies immediately to the North. The author describes the role of General James Oglethorpe, Governor of Georgia in the 1740 English invasion of Spanish Florida. The capture and destruction of St. Augustine was the principle objective. The author presents basic historical data concerning the unsuccessful 27 day seige by a combined land and naval force, which was followed by abandonment of the enterprise. The report is documented, includes a bibliography, and plans and maps.

5E. Human Factors Engineering

AD-767 066/4GA PC$4.25/MF$1.45
New Mexico State Univ University Park Dept of Psychology
COLOR RESEARCH FOR VISUAL DISPLAYS.
Final rept. 1 Feb 72-31 Jul 73,
Richard E. Christ, and Warren H. Teichner. Jul 73, 117p* Rept no. NMSU-JANAIR-FR-73-1
JANAIR-730703
Contract N00014-70-A-0147-0003

Descriptors: (*Display systems, Colors), (*Aircraft equipment, *Human engineering), Instrumentation, Visual perception, Identification, Reviews, Target discrimination.
Identifiers: Redundancy.

The experimental literature on the ceffects of color on visual search and identification performance was reviewed. Forty-three studies published between 1952 and 1973 were located that gave results which could be used to determine the effectiveness of color codes relative to various types of achromatic codes. Quantitative analyses of these results indicated that color may be a very effective performance factor under some conditions, but that it can be detrimental under others. Tentative conclusions about the nature of these conditions were derived from the results and these conclusions were supported by an exploratory experiment. A guide for design decisions and an indication of knowledge gaps are also provided. (Author)

AD-767 201/7GA PC$3.75/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
EXCURSIONS OF HEAD, HELMET AND HELMET-ATTACHED RETICLE UNDER +G FORCES.
Final rept.,
Kenneth W. Kennedy, and K. H. Eberhard Kroemer. May 73, 89p Rept no. AMRL-TR-72-127

Descriptors: (*Helmets, Acceleration tolerance), (*Optical equipment, Acceleration tolerance), Head, Motion, Pitch(Motion), Yaw, Roll, Rotation, Human engineering.
Identifiers: Reticles, *Angular acceleration.

Open-loop centrifuge runs reaching +6g(z) were performed with 13 subjects wearing two different types of helmets: the foam-padded standard HGU-2A/P, and the Gentex 129-2 with adjustable web suspension. Rigidly attached to the helmet was a lightweight reticle with its crosshair about 1-1/2 inches in front to the left eye. Masses were attached at top and sides of the helmets. The total maximal load was limited to 40 ounces, and the largest lateral off-balance to 15 ounces. During the centrifuge runs, each subject attempted to maintain his gaze at a target directly in front of him. Hence, no voluntary motion of the head should have occurred. Position of head, helmet, and reticle were recorded photographically at each g-level. From the photographs, data on actual excursions of the head, helmet, and reticle were extracted and subjected to a computer-aided analysis. Involuntary angular head movements, as well as rotational displacements of the helmet on the head, are discussed in this paper in terms of pitch, roll and yaw. Also described are linear changes in the vertical height of the subjects' eyes. Reticle displacements are discussed as they occurred in a frontal y-z plane. (Author)

AD-767 206/6GA Reprint
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
COMBIMAN-COMPUTERIZED BIOMECHANICAL MAN-MODEL. COMBIMAN-BIOMECHANISCHES COMPUTER-MODELL DES MENSCHEN,
K. H. E. Kroemer. 1972, 18p Rept no. AMRL-TR-72-16
Summary in German.
Availability: Pub. in Proceedings of IFU Colloquium 'Space Technology - A Model for Safety Techniques and Accident Prevention', Cologne, Germany, Apr 72 p73-88.

Descriptors: (*Body, Models(Simulations)), (*Human engineering, Aircraft), Computers, Anthropometry, Ergometers, Mathematical models.
Identifiers: *Biomechanics.

A computerized body analog, representing anthropometry, biomechanics, and ergonomics, will be useful in evaluating existing systems and in the future will be essential from the earliest stages in the development of new systems. Such an analog of the human operator, within the geometry of the work station, is currently being developed. It is called COMBIMAN, an acronym for COMputerized Biomechanical MAN-model. COMBIMAN is an engineering tool for representing the geometry and physics of the man-cockpit system. This paper summarizes a literature review, presents a general discussion of computer models representing the geometry of the operator at his work station, develops a strategy of the mathematical and computerization concepts, and describes the development phases of COMBIMAN. (Modified author abstract)

AD-767 212/4GA PC$3.50/MF$1.45
Indiana Univ Bloomington Div of Optometry
COMPARATIVE PERFORMANCE OF AVIATION FILTERS ON THE HUMAN CONTRAST SENSITIVITY FUNCTION.
Final rept. Mar 71-Jun 73,
Ronald W. Everson, and John R. Levene. Jul 73, 73p AMRL-TR-73-13
Contract F33615-71-C-1730

Descriptors: (*Ultraviolet filters, *Aviation personnel), Optical filters, Eyeglasses, Performance(Engineering), Thresholds(Physiology), Light, Ophthalmology.

Grating targets of different spatial frequency and with square and sine wave luminance distributions were presented to male subjects who wore ophthalmic filters that are frequently used by aviators, namely, neutral gray, yellow, and rose-colored. Threshold light modulation that permitted detection of the grating pattern was determined. Average luminance levels from bright to dim were used. Although contrast sensitivity was found to vary with luminance level, it has not been possible to demonstrate the clear-cut superiority of one colored sunglass filter over another in this experiment. The differences that are seen are related to the luminous transmittances of the filter and not to their intrinsic colorations. (Author)

N73-27950/7GA PC$4.00/MF$1.45
Virginia Univ., Charlottesville. Transportation Div.
ANALYSIS OF PASSENGER ACCEPTANCE OF COMMERCIAL FLIGHTS HAVING CHARACTERISTICS SIMILAR TO STOL.
A. R. Kuhlthau, and I. D. Jacobson. Mar 73, 37p NASA-CR-132282, TR-403208
Contract NGR-47-005-181
Conf-Presented at Flight Test Symp., Ottawa, 7-8 Mar. 1973.

Descriptors: *Air transportation, *Passengers, *Short takeoff aircraft, Comfort, Commercial aircraft, Data sampling, Management planning, Mathematical models, Parameterization.

For abstract, see STAR 1119

PATENT-3 725 953/GA Not available NTIS
Department of the Navy Washington D C
FULL VIEW DIVER'S MASK.
Patent,
Clarence S. Johnson, and Arthur F. Langguth.
Filed 24 Jan 72, patented 10 Apr 73, 4p Rept nos. PAT-APPL-220 026,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Human engineering, *Breathing masks), (*Patents, Breathing masks), Design, Face, Vision, Interference, Diving.
Identifiers: PAT-CL-2-14-W.

The invention relates to a face mask having a rigid transparent member defining a frontal portion and two curved side portions allows for wide-angle vision with little distortion. An outwardly bulging nose portion is provided to permit a close fitting on the face and to reduce the mask's entrained mass. A resilient seal formed with an annular cross-sectional configuration is fitted about the periphery of the transparent member to ensure a sealed fitting on a number of differently contoured faces by resiliently compensating for the dissimilar facial features. Including the disclosed seal minimizes discomfort when the mask is worn for prolonged periods of time since the seal does not dig into the fleshy portions of the face.

5G. Linguistics

AD-767 571/3GA PC$4.50/MF$1.45
Latsec Inc La Jolla Calif
OPTIMIZATION OF SYSTRAN SYSTEM.
Final rept. 1 Jan 72-31 Mar 73,
Peter P. Toma, Lukek A. Kozlik, and Donald G. Perwin. May 73, 149p RADC-TR-73-155
Contract F30602-72-C-0169
Report on Optimization of Russian-English Machine Translation System.

Descriptors: (*Machine translation, *Russian language), Computational linguistics, English language, Syntax, Programming(Computers).
Identifiers: SYSTRAN system.

The report describes improving the output of the SYSTRAN System for machine translation of Russian scientific and technical literature into English in an operational environment. The approach to output improvement is based upon analysis of a large amount of SYSTRAN-translated Russian text. The areas of output-language construction under study include (1) transfer grammar problems, i.e., grammatical conversion of Russian adnominal genitive constructions, deverbative noun constructions and voice, number conversion, and (2) synthesis problems, i.e., English equivalent suppression, article insertion, disambiguation of dash and others. Input language analysis for purposes of structural disambiguation includes syntax and word classes, i.e., 'measure parameters and measurables,' subject/predicate correlations, strong and weak adnominal genitive government and others. A brief description of programming for retrieval of text examples used as the data base linguistic improvements in this report is also given. (Modified author abstract)

N73-27144/7GA PC$3.00/MF$1.45
National Physical Lab., Teddington (England). Div. of Computer Science.
AUTOMATIC ERROR CORRECTION IN NATURAL TEXTS, SUPPLEMENT.
A. J. Szanser. Jan 73, 19p NPL-COM-SCI-63-SUPPL
Misc-Supplement to Npl-COM-Sci-46: See N71-35330.

Descriptors: *English language, *Error detection codes, *Matching, *Words (Language), Computer programs, Error correcting devices, Language programming, Orthography, Syntax, Texts.

For abstract, see STAR 1118

5H. Man-Machine Relations

N73-27176/9GA PC$27.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
ATTACHED MANIPULATOR SYSTEM DESIGN AND CONCEPT VERIFICATION FOR ZERO-G SIMULATION.
Final Report.
R. Booker, W. Burkitt, P. Corveleyn, P. Cramer, and O. Duwaik. Jun 73, 498p NASA-CR-133964, JSC-08021
Contract NAS9-13027

Descriptors: *Cargo, *Manipulators, *Simulators, *Space shuttles, *Weightlessness, Handling equipment, Systems engineering, Teleoperators.

For abstract, see STAR 1118

N73-27419/3GA PC$5.75/MF$1.45
URS/Matrix Co., Huntsville, Ala. Man Systems Div.
DESIGN OF A TERMINAL POINTER HAND CONTROLLER FOR TELEOPERATOR APPLICATIONS.
Final Report, 25 Apr. 1972 - 25 Jun. 1973.
E. L. Saenger, and W. S. Woltosz. 25 Jun 73, 71p NASA-CR-124307, PRL-360
Contract NAS8-28760

Descriptors: *Hand (Anatomy), *Pointing control systems, *Teleoperators, Compatibility, Human factors engineering, Man machine systems.

For abstract, see STAR 1118

N73-27946/5GA PC$6.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
SPACE ERGONOMICS.
A. I. Menshov. Jul 73, 499p NASA-TT-F-750
Contract NASW-2035

Tran-Transl. Into English of the Book "Kosmicheskaya Ergonomika" Leningrad, Nauka Press, 1971 296 p.

Descriptors: *Astronaut performance, *Human factors engineering, *Manned spacecraft, Information management, Man machine systems, Mathematical models, Work capacity.

For abstract, see STAR 1119

N73-27949/9GA PC$14.25/MF$1.45
Essex Corp., Alexandria, Va.
APPLICATIONS OF SPACE TELEOPERATOR TECHNOLOGY TO THE PROBLEMS OF THE HANDICAPPED.
T. B. Malone, S. Deutsch, G. Rubin, and S. W. Shenk. Jul 73, 241p NASA-CR-133357
Subm-Sponsored by NASA.

Descriptors: *Manipulators, *Technology utilization, *Teleoperators, Handicaps, Hazards, Limbs (Anatomy), Remote control.

For abstract, see STAR 1119

51. Personnel Selection, Training, and Evaluation

AD-767 081/3GA PC$2.75/MF$1.45
California Univ Irvine Graduate School of Administration
PERCEIVING JOBS IN THE ORGANIZATION.
Technical rept.,
Robert Dubin, Lyman W. Porter, Eugene F. Stone, and Joseph E. Champoux. Aug 73, 23p Rept no. TR-19
Contract N00014-69-A-0200-9001
Report on Individual-Organizational Linkages.

Descriptors: (*Job analysis, *Perception(Psychology)), (*Organizations, *Sociometrics), Civilian personnel, Attitudes, Social psychology, Group dynamics, Manpower studies.
Identifiers: Peer ratings, Self ratings, Supervisors employee ratings.

Differential perceptions of standard and long established jobs in a stable organization were obtained for sixteen jobs rated on eight characteristics by job incumbents, peers, and supervisors. Incumbents in entry-level jobs evaluated such jobs more highly than did their peers or supervisors, while incumbents in highly skilled terminal-type craft jobs evaluated their jobs less positively than did their peers or supervisors. Results of the study are discussed in terms of the social and psychological processes that may have influenced the various groups' ratings. (Modified author abstract)

AD-767 195/1GA PC$2.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
DEVELOPMENT OF THE E-2 WEIGHTED AIRMAN PROMOTION SYSTEM.
Doris E. Black. Apr 73, 21p Rept no. AFHRL-TR-73-3

Descriptors: (*Personnel management, Air Force), (*Manpower studies, Performance tests), (*Air force personnel, Selection), Psychometrics, Decision theory, Decision making, Statistical analysis.
Identifiers: Classifications, Personnel selection, Evaluation, Ranking.

To conform with new Air Force requirements for grade and promotion controls the Air Training Command found it necessary to develop a fair and visible system for selecting the top 15% of each Basic Military School class for promotion to E-2 upon completion of training. A candidate system was developed by the Personnel Research Division of the Air Force Human Resources Laboratory in a policy capturing study in which a six-man promotion policy board was convened to rank-order a representative BMT airman sample for promotion. The rankings performed by the board were done with respect to each trainee's promotability taking into account the following five promotion factors identified by ATC: The average score on the AFQT and four AQEs; the overall grade on the 25th day of training proficiency evaluations; the BMT written examination; the Military Training Instructor recommendation score; and the student leader score. Using regression analysis, each board member's promotion policy was expressed in terms of a mathematical equation, and the system of regression weights developed for each board member was used in deriving, by a hierarchial grouping method the overall policy representing a consensus on the promotion policy. In general, there was high intra-rater consistency throughout the large number of records reviewed by board members. The derived promotion policy equation weights efficiently replicated the individual policies of a majority of board members. This paper describes the composition and operation of the policy board, the sample of Basic Military Training personnel records which were examined, and the statistical analysis.

AD-767 196/9GA PC$3.50/MF$1.45
System Development Corp Santa Monica Calif
AUTOMATIC DATA PROCESSING SYSTEM AND PROCEDURES COMPUTERIZED ACADEMIC COUNSELING SYSTEM.
Final rept.,
Henry J. Zagorski, Lemont E. Southworth, Stuart E. Charlston, Gloria L. Grace, and Russell L. Smith. Jun 73, 55p AFHRL-TR-73-6
Contract F41609-71-C-0028

Descriptors: (*Students, Preparation), (*Programmed instruction, Selection), (*Programming(Computers), *Personnel management), Universities, Optimization, Data processing systems, Problem solving, Systems engineering, Mathematical models, Statistical analysis, Probability, Air force personnel.
Identifiers: *Counseling, Academic majors, Career development, Recommendations.

The report provides a technical analysis and review of a computerized academic counseling system (CACS) designed and constructed to assist counselors in guiding undergraduate college students toward the selection of optimal academic majors. Problem review and definition, system analysis, design rationale, methodological approach, measurement specifications, data base compilation, mathematical modeling, statistical results, and validation tests are presented in various degrees of detail. Counseling application directions, capabilities, and potential are described. Computerized academic counseling is discussed in the context of career success likelihood. Reccomendations for extending the approach to include additional aspects of career guidance are made. (Modified author abstract)

AD-767 197/7GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
ANALYSIS OF AIR FORCE INSTITUTE OF TECHNOLOGY COURSE NO. 475 'LABORATORY MANAGEMENT OF R AND D'.
Final technical rept.,
William B. Askren. Aug 73, 49p Rept no. AFHRL-TR-73-27

Descriptors: (*Scientific personnel, *Air force training), (*Engineering personnel, *Research program administration), Programmed instruction, Reviews, Laboratories, Job analysis, Documentation.
Identifiers: Research and development, Recommendations.

An Air Force research and development management course was analyzed to determine if such a course is needed, what form it should take, and what subjects should be included in the curriculum. Laboratory Commanders favored retaining the course but believe it should be changed. The study recommends that the course be reoriented to training the new laboratory scientist/engineer regarding the duties of his job, and shortened to a maximum of 15 days using 21 priority subject matter topics, and that a handbook be developed to supplement the course. (Modified author abstract)

AD-767 198/5GA PC$2.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
RELATIONSHIP BETWEEN PERSONALITY TRAITS AND OFFICER PERFORMANCE AND RETENTION CRITERIA.
Final rept.,
Faye Shenk, Thomas W. Watson, and Joe T. Hazel. May 73, 15p Rept no. AFHRL-TR-73-4

Descriptors: (*Air Force personnel, *Psychometrics), (*Performance(Human), *Personality), Correlation techniques, Statistical analysis, Officer personnel, Efficiency.
Identifiers: Retention rates(Personnel).

Three self-report personality inventories (FCSRI-A, FCSRI-B, DAI) and a peer rating scale designed to measure five personality factors; surgency, agreeableness, conscientiousness, emotional stability, and culture were examined. Regression analysis techniques were applied using these measures to predict retention and officer effectiveness as measured by Officer Effectiveness Reports (OERs). Analysis of the data indicated that measurements based on the peer ratings had higher predictive value for both criteria than the factor scores derived from the paper-and-pencil personality tests which rarely reached significance levels. Furthermore, peer ratings had a higher level of prediction for officer performance than retention. A regression equation including the self-report inventories, peer rating factors, and peer rating traits yielded an R of .19 for retention and an R of .36 for officer performance measures. When grade, Duty Air Force Specialty Code (DAFSC) and education were included as predictor variables, the correlations were .39 for retention and .43 for the OER rating. (Modified author abstract)

AD-767 199/3GA PC$2.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAMS (CODAP): GROUP MEMBERSHIP (GRMBRS/GRPMBR) AND AUTOMATED DIAGRAMMING (DIAGRM) PROGRAMS.
Technical rept.,
William J. Phalen, and Raymond E. Christal. Apr 73, 18p Rept no. AFHRL-TR-73-5

Descriptors: (*Job analysis, *Programming(Computers)), (*Data processing systems, *Armed forces(United States)), Groups(Mathematics), Systems engineering, Personnel management, Statistical data, Air Force research.
Identifiers: *Comprehensive occupational data analysis programs.

The personnel research division of the Air Force Resources Laboratory has been working for the past ten years on a comprehensive set of data analysis programs called CODAP. These programs are designed for analyzing and retrieving occupational survey information collected by means of job inventories. Many of the time-consuming routines were coded in machine language (MAP), thus making it difficult for agencies not having access to this specific piece of equipment to make use of these powerful analysis programs. It has been arranged to get the system operational on an IBM 370-155 computer for possible use by all military services, as well as the United States Coast Guard. A series of technical reports is being prepared,

each of which will describe one or more of the CODAP programs. This report describes two of these programs.

AD-767 249/6GA PC$3.50/MF$1.45
Consad Research Corp Pittsburgh Pa
SIMPO-I GENERAL ENTITY SIMULATOR (GES).
Technical research rept.,
Alan Colker, James S. Leib, Kenneth W. Hayman, and Sidney A. Sachs. Jun 73, 52p ARI-TRR-1170
Contract DAHC19-69-C-0001

Descriptors: (*Personnel management, *Programming(Computers)), (*Manpower, Mathematical models), Simulators, Systems engineering, Subroutines, Computer logic, Programming languages, Army research.
Identifiers: *General entity simulator, Computerized simulation, Simpo 1 simulator.

The report describes the development and preliminary testing of a generalized personnel entity modeling system. A research project was undertaken to develop a computerized modeling capability which could be used to simulate and evaluate many different Army manpower systems without reprogramming. The general entity simulator (GES) was developed to provide users of the SIMPO-I simulation package analyses usually not possible with more general mass flow models. (Modified author abstract)

AD-767 279/3GA PC$5.25/MF$1.45
System Development Corp Santa Monica Calif
U. S. ARMY SELECTION CENTER EVALUATION STUDY.
Final technical rept. 14 Jul 72-29 Jun 73,
Robert L. Kent. 29 Jun 73, 186p Rept nos. SDC-TM-5138/000/00, SDC-73-9
Contract DAHC19-72-C-0012

Descriptors: (*Army personnel, *Recruiting), (*Aptitude tests, Job analysis), Selection, Performance(Human), Attitudes, Questionnaires.
Identifiers: *Job satisfaction, Orientation(Training), Comparison, Recommendations.

The U.S. Army selection center (provisional) was in operation from February to November 1972 on an experimental basis to evaluate improved orientation and placement of volunteers for U.S. Army service. Its primary objectives were to improve attitudes, job satisfaction, and job performance of enlistees. This document reports the results of the evaluation of the impact of the selection center process, as compared to the impact of the Armed Forces Entrance Examination Station (AFEES) process, on attitudes, job satisfaction, and job performance of enlistees in Advanced Individual Training (AIT) and at their first unit of assignment. Major findings were: the achievement of improved attitudes at the selection center was offset by other factors after enlistment, the selection center provess did not result in improved job satisfaction, most enlistees had positive attitudes toward their jobs but had jobs which did not provide interest, challenge, or involvement, selection center enlistees were rated at least as high or higher than AFEES enlistees on performance characteristics but not significantly higher, and enlistees who believed information received prior to enlistment to be more accurate and comprehensive had more positive attitudes, greater job satisfaction, and better performance. (Author)

AD-767 325/6GA PC$3.00/MF$1.45
Center for Naval Analyses Arlington Va
METHODOLOGY FOR USING DRAFT LOTTERY DATA TO ESTIMATE TRUE VOLUNTEERS,
Christopher Jehn, and Hugh E. Carroll, II. May 73, 17p Rept no. CNA-Research Contrib-247
Contract N00014-68-A-0091

Descriptors: (*Military personnel, *Recruiting), (*Manpower, Mathematical prediction), Armed forces(United States), Statistical data, Motivation, Reviews, Correlation techniques.
Identifiers: *Volunteers, *Draft lottery, Estimating.

Methodologies for estimating true volunteers were evaluated using draft lottery data. An appropriate method was identified for predicting the supply of first term enlistees in a draft free environment. Although the method should produce reasonably accurate estimates of the number of true volunteers, periods of demand constraint must be considered in the analysis. (Author)

AD-767 339/5GA PC$3.75/MF$1.45
Decision Systems Associates Inc Rockville Md
DEVELOPMENT OF AN OPTIMAL MATHEMATICAL METHODOLOGY TO ACHIEVE CULTURE-FAIR ASSIGNMENT OUTCOMES FOR THE PERSONNEL ASSIGNMENT PROBLEM.
Final rept. 1 Jul 72-31 May 73.
Jun 73, 95p
Contract N00014-73-C-0334

Descriptors: (*Personnel management, *Armed Forces(United States)), (*Military personnel, Distribution), Management planning, Statistical distributions, Military training, Deployment, Job analysis, Inequalities, Algorithms, Mathematical models, Optimization, Programming(Computers).
Identifiers: Enlisted personnel, Minority groups, Policies.

The report describes research and development of an efficient, optimal solution to the problem of providing equitable entry-level training opportunities for minority group accessions. The computer-based recruit assignment process was primarily influenced by optimization of aptitude test information which resulted in a disproportionate concentration of minority personnel in the soft skills. As a result, the assignment outcome had significant disadvantages for both the Marine Corps and the individuals involved. The research has resulted in an efficient approach which, through utilization of specially-adapted primal-dual network flow algorithms, guarantees optimal adherence to any given minority distribution policy subject to mandatory course prerequisites and enlistment guarantees. (Modified author abstract)

AD-767 352/8GA PC$3.25/MF$1.45
Army War Coll Carlisle Barracks Pa
ZERO-DRAFT PRIMER TO MAINTAIN TROOP STRENGTH IN THE ARMY NATIONAL GUARD.
Student essay,
Nelson W. Dwight. 27 Dec 71, 22p

Descriptors: (*Army personnel, Personnel management), Motivation, Recruiting.
Identifiers: National Guard.

Despite the recent addition of new incentives to encourage retention and recruiting in the Army National Guard, strength continues to decline. Waiting lists have all but disappeared. An anti-military feeling still persists in the nation. Pay raises and other positive administrative and training innovations have been effected. Modern equipment is being distributed to the Reserve Components charged with new and more demanding mobilization and depolyment requirements. Additional incentives are proposed to positively encourage enlistments and motivate retention. These incentives are: education assistance grants, a system of flexible reenlistment bonus, retirement improvement, and extension of Servicemen's Group Life Insurance on fulltime basis -- Priority Recruiting Incentives Motivating Enlistment and Retention (PRIMER). (Author)

AD-767 353/6GA PC$3.50/MF$1.45
Army War Coll Carlisle Barracks Pa
A SUMMARY OF ACTIONS TAKEN AND PROBLEMS STILL CONFRONTING THE FORMATION OF AN ALL-VOLUNTEER ARMY.
Student essay,
Donald J. McKeon. 1 Nov 71, 27p

Descriptors: (*Army personnel, Personnel management), Reviews, Department of Defense.
Identifiers: All volunteer armed forces.

The basic problem stems from public dissatisfaction with the draft during the Vietnam War and the President's wish to revert to a zero draft with an all-Volunteer Military Force. Many issues which remain from days past must be resolved in order that the President's desires may be fulfilled. The paper touches by the Department of Defense and Department of the Army. Some successful and unsuccessful actions taken by the British and the Canadians are surveyed. The paper ends with a summation of what the author believes to be the heart of the matter. (Author)

AD-767 358/5GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
THE ALL-VOLUNTEER ARMED FORCE--ITS FEASIBILITY AND IMPLICATIONS.
Monograph,
Jack R. Butler. 3 Jan 72, 45p

Descriptors: (*Army personnel, Personnel management), Reviews, Feasibility studies.
Identifiers: All volunteer armed forces.

The monograph addresses the critical factors associated with achieving an all-volunteer armed force. It develops from historical considerations the basic issues of quantity, quality, and flexibility and examines these in light of changing social and political patterns with particular emphasis on their implications for the Army. It concludes that an all-volunteer armed force is feasible at a cost given the support of the military leadership, the Congress, and the public at large. (Author)

AD-767 359/3GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
DOES THE ARMY HAVE STANDARDIZED TRAINING. A COMPARISON OF PHYSICAL FITNESS TEST SCORES FOR FIVE BASIC COMBAT TRAINING COMPANIES.
Monograph,
Ronald E. Ice. 28 Feb 72, 46p

Descriptors: (*Army training, Standardization), Efficiency, Physical fitness, Combat readiness, Infantry, Analysis of variance.

The US Army has been seeking to train its units to the highest level of operational proficiency and standardized on that level. The paper examines the standardization of training using a statistical analysis of physical fitness test scores for five basic combat training companies. The multiple t Test and Snedicor's Analysis of Variance techniques were used. The results showed a significant difference at both the .05 and .01 levels thus indicating that training within the Army is not standard. (Modified author abstract)

AD-767 362/7GA PC$8.50/MF$1.45
Behaviormetrics Santa Monica Calif
REQUIREMENTS, CONCEPT, AND SPECIFICATION FOR A NAVY HUMAN PERFORMANCE DATA STORE,
Robert E. Blanchard. Apr 73, 130p Rept no. 102-2
Contract N00140-72-C-9351

Descriptors: (*Performance(Human), Statistical data), (*Naval personnel, *Data storage systems), Human engineering, Naval operations, Classification, Specifications, Theory, Military requirements, Naval equipment.
Identifiers: Management information systems, Concepts, Procedures.

A Navy human performance data store specification was developed based upon guidelines evolved from general user needs for data and data store characteristics, input data requirements for currently available models, and a conceptual model for a Navy human performance data bank system. The specification is based on a framework comprising seven components. (Modified author abstract)

AD-767 377/5GA PC$3.00/MF$1.45
Naval Aerospace Medical Research Lab Pensacola Fla
ISOLATION OF RECURRING STUDENT PILOT ERRORS DURING PRIMARY FLIGHT TRAINING. I. SPIN MANEUVER,
Richard H. Shannon, Wayne L. Waag, and Gerald M. Long. 15 Aug 73, 43p Rept no. NAMRL-1189

Descriptors: (*Pilots, *Training), (*Performance(Human), Statistical analysis), Students, Analysis, Errors, Spin, Questionnaires, Instructors, Predictions.
Identifiers: Pilot training.

The investigation attempted to: Develop a conceptual model for investigating student naval aviator (SNA) performance in primary flight training; isolate, with the use of the model, those behaviors within the spin maneuver which are judged to be recurring student pilot errors; assess the criticality of these errors as they relate to the grades a student receives; and provide behavioral definitions of the global skills, basic airwork, headwork, and procedures. A procedural type of task analysis was performed on the spin maneuver. The necessary responses to each display and control both within and outside the aircraft were specified on a sequential continuum. Within each of these sequential components, a highly elemental approach (i.e., emphasis on the simultaneous individual responses to each display and control at each point in time) was taken so that it was possible to isolate the required simultaneous response configuration at any given point throughout the maneuver. An objectively structured questionnaire was developed using these individual task elements as the basic item pool, and administered to a sample of 97 flight instructors in primary flight training. The results of this investigation indicated that the recurring student errors within the spin maneuver could be isolated using this type of approach. Further, the definitions for the terms basic airwork, headwork and procedures and what constitutes a 'critical' error were set forth. (Author)

AD-767 577/0GA PC$2.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
ATTITUDES OF AIRMEN TOWARD THE WEIGHTED AIRMAN PROMOTION SYSTEM.
Final rept.,
Walter C. Vertreace, and Stephen B. Knouse. Apr 73, 16p Rept no. AFHRL-TR-73-2

Descriptors: (*Air Force personnel, *Attitudes), Reviews, Aptitude tests, Statistical processes, Questionnaires.
Identifiers: *Weighted airman promotion system, WAPS(Weighted Airman Promotion System), Enlisted personnel.

The weighted airman promotion system (WAPS) was designed to select airmen for promotion on the basis of six weighted factors. It was instituted as a means for increasing knowledge of standing in promotion competition and insuring equitable promotion opportunities. The present survey was initiated to assess the attitudes of airmen affected by WAPS and determine if airmen perceive WAPS as having fulfilled its objectives. (Modified author abstract)

AD-767 578/8GA PC$2.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
VALIDITY OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY, FORM 1, TO PREDICT TECHNICAL SCHOOL SUCCESS,
Bart M. Vitola, Cecil J. Mullins, and Paul R. Croll. Jul 73, 18p Rept no. AFHRL-TR-73-7

Descriptors: (*Air Force personnel, *Aptitude tests), (*Performance tests, Reliability), Test construction(Psychology), Standardization, Correlation techniques, Technicians, Operators(Personnel).
Identifiers: Airman qualifying examination, Armed services vocational aptitude battery.

Validities of the four aptitude indexes of the Armed Services Vocational Aptitude Battery (ASVAB), Form 1, and the Airman Qualifying Examination-66 (AQE), were determined for final grades in 46 airman training courses. Comparisons were made between AQE and ASVAB in terms of their ability to predict technical school success. The data demonstrate that ASVAB is an effective instrument for use in the military high school testing program and may be used satsifactorily, as is AQE, to assign enlistees to technical training. (Modified author abstract)

AD-767 579/6GA PC$2.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
COMPARATIVE DATA ON A SAMPLE OF ALL-VOLUNTEER ENLISTEES WITH 1970 THROUGH 1972 AIR FORCE ACCESSIONS,
Bart M. Vitola, Cecil J. Mullins, and Leland D. Brokaw. Jul 73, 14p Rept no. AFHRL-TR-73-26

Descriptors: (*Air force personnel, Statistical data), (*Recruiting, Predictions), Motivation, Education, Manpower, Aptitude tests, Males.
Identifiers: Ethnic groups, Enlistment incentives, Aptitude levels, All volunteer armed forces.

A data base was established to which characteristics of the all-volunteer force could be compared. If the hypothesis is tenable that the sample of 1973 enlistees used in this study represents the qualitative characteristics of the all-volunteer force, current aptitude levels suggest sufficient quality for the majority of Air Force jobs. Analysis of the data resulted in the following conclusions: (a) There has been a gradual loss of high aptitude people over a three-year period. If this trend continues, there will be a probable need to offer further incentives to enlist individuals who can perform in the more critical aptitude areas. (b) There will be no dramatic increase in the proportion of Negroes in the all-volunteer force. Air Force has enlisted, and continues to enlist, a proportion of Negroes equal to, or greater than, the proportion of Negroes in the population. (c) Under present reenlistment policy considerations, Air Force will remain an excellent source from which industry may draw skilled personnel in over 200 job types. (Author)

AD-767 580/4GA PC$3.50/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
SELECTION AND ANALYSIS OF UPT MANEUVERS FOR AUTOMATED PROFICIENCY MEASUREMENT DEVELOPMENT,
David R. Baum, James F. Smith, and Ronald A. Goebel. Jul 73, 57p Rept no. AFHRL-TR-72-62

Descriptors: (*Flight simulators, *Air Force training), (*Performance tests, *Pilots), Flight paths, Automation, Performance(Human), Jet training planes.
Identifiers: Task selection, Flight maneuvers, T-37 aircraft.

A program exists within the Air Force Human Resources Laboratory to develop techniques for automated assessment of pilot performance. To insure that quantitative assessment capabilities are available for the evaluation of the Advanced Simulator for Underground Pilot Training (ASUPT) and to make efficient use of existing resources, measuremtnt development is being limited initially to six aircraft maneuvers. These are (a) Lazy 8, (b) Barrel Roll, (c) Normal Pattern and Landing, (d) Cloverleaf, (e) Normal Spin, and (f) Split-S. The rationale for selection of these particular maneuvers is discussed in the first part of this report. Subsequent to selection, extensive maneuver analyses were performed. The analysis format was chosen specifically for the purpose of supporting automated proficiency measurement development. These categories of information which constitute the analyses are described and the procedures whereby the information was obtained are detailed. (Author)

AD-767 609/1GA PC$5.25/MF$1.45
Westinghouse Electric Corp Columbia Md Health Systems Div
METHODS FOR ESTIMATING AND ENHANCING THE MILITARY POTENTIAL OF SELECTED MANPOWER SEGMENTS.
Final rept. 1 Jun 72-30 Jun 73,
Barbara L. Seboda, E. Frank Harrelson, Robert L. Crawford, and Louis Robinson, Jr. Aug 73, 197p*
AFOSR-TR-73-1701
Contract F44620-72-C-0093

Descriptors: (*Manpower studies, *Recruiting), (*Air Force, Recruiting), Attitudes, Questionnaires, Economics, Education, Reaction(Psychology), Students, Maryland.
Identifiers: Blacks, Black white comparisons, Interviews, Baltimore(Maryland), High school students, *All volunteer armed forces.

The results of interviews with 116 Baltimore city high school students during April - May 1973 are presented. Interest in joining the Armed Services (particularly the Air Force) was assessed, as well as income level and academic achievement of the predominantly Black sample. Responses of interested and disinterested students are compared. Relative to Armed Services enlistment in an all-volunteer environment, the interested group was more likely to emphasize the positive attractions of education and training, and the disinterested group emphasized the negative aspects of loss of individual freedom. A demographic methodology to select survey sites for population subgroup analyses is included. (Modified author abstract)

AD-767 640/6GA PC$3.50/MF$1.45
Naval Postgraduate School Monterey Calif
PERFORMANCE EVALUATION OF CHAPLAINS IN THE UNITED STATES NAVY.
Master's thesis,
David Edward White. Jun 73, 63p

Descriptors: (*Religion, *Professional personnel), (*Naval personnel, *Performance(Human)), Measurement, Standards, Reviews, Test construction(Psychology), Theses, Questionnaires.
Identifiers: *Chaplains, Performance evaluation, Criteria, *Critical incident technique.

An attempt is made to identify primary criteria with which to evaluate the performance of chaplains serving on active duty in the United States Navy. A review of performance evaluation is presented in which the earliest developments are discussed and compared with the changes which have been made in the Fitness Report over the years. A research study was conducted using the critical incident techniques to gather data on effective and ineffective task behavior of chaplains. From an analysis and classification of the data a listing of primary criteria was developed from which rating scales for the evaluation of chaplains may be developed. (Author)

PB-223 266/8GA PC$7.25/MF$1.45
Academy for Educational Development, Inc., New York.

TECHNICAL-ECONOMIC CONSIDERATIONS IN PUBLIC SERVICE BROADCAST COMMUNICATIONS FOR DEVELOPING COUNTRIES,
R. Butman, G. Rathjens, and C. Warren. 1973, 332p 73-9
Contract AID/csd-2829
Prepared in cooperation with the Massachusetts Inst. of Technology.

Descriptors: (*Education, *Developing countries), (*Television systems, Schools), (*Communication satellites, Education), Brazil, India, Ethiopia, Telecommunication, Economic factors, Policies, Cost analysis, Radio broadcasting, Services, Engineering.
Identifiers: Satellite television systems, Technological development.

The report represents the culmination of an inquiry into the distribution of educational material in developing countries, with particular attention to the problems and opportunities in Brazil and India. Emphasis on the use of television and satellites to distribute T.V. programming is a reflection of the interest in the use of satellite-T.V. systems in two countries. The report includes techno-economic factors, cost and policy considerations, comments on expanding radio and television broadcasting services in Ethiopia, and technical aspects of educational communication technologies.

PB-223 334/4GA PC$7.75/MF$1.45
Palm Beach County Area Planning Board, West Palm Beach, Fla.
DEMOGRAPHIC CHARACTERISTICS, MANPOWER NEEDS AND PROGRAM RESOURCES.
Jun 73, 112p Human Resources TP-1

Descriptors: (*Manpower utilization, *Florida), Employment, Projects, Vocational guidance, Industrial training, Demography, Surveys, Requirements, Industrial relations.
Identifiers: Job market, Palm Beach County(Florida).

The report outlines demographic trends, summarizes employment activity, discusses job market characteristics, and reviews occupational training programs in Palm Beach County, Florida.

PB-223 335/1GA PC$4.50/MF$1.45
Manpower Administration, Washington, D.C. Div. of Public Career Programs.
NEW CAREERS PROGRAM HANDBOOK.
May 73, 144p PSC-NC-025

Descriptors: (*Manpower utilization, *Personnel development), (*Employment, Project planning), (*Vocational guidance, *Handbooks), Personnel management, Personnel selection, Standards, Requirements, Job analysis, Socioeconomic status, Performance evaluation, Reporting.
Identifiers: New careers programs, Paraprofessional personnel, Career ladders, Disadvantaged groups, Eligibility, Human services.

The handbook describes the design and specifies the operating procedures for new careers projects funded by the Department of Labor. Such issues as the program and sponsor standards, eligibility requirements, contracting, reporting and self-appraisal systems, jobs in the human services and technical assistance are explained in detail and specific examples are given. The handbook would be useful to project managers as an instruction booklet and to other personnel innovators or manpower designers as a model for manpower utilization in paraprofessional jobs in the human service fields.

PB-223 442/5GA PC$4.50/MF$1.45
Northern Area Planning Organization, N. Mex.
EXPANSION OF ECONOMIC BASE ANALYSIS: LABOR AVAILABILITY IN NORTH-CENTRAL NEW MEXICO.
Final rept.,
Garrey E. Carruthers, Kathy Renner, and N. Scott Urquhart. Aug 73, 46p NAPO-1972-1973/3
Errata sheet inserted. Prepared in cooperation with New Mexico State Planning Office, Las Cruces. Also pub. as New Mexico Agricultural Experiment Station. Special Report 30.

Descriptors: (*Manpower, Mobility), (*Industrial relations, *New Mexico), Regional planning, Evaluation, Travel, Attitudes, Urban areas, Data processing, Computer programming, Statistical data, Methodology, Economic development, Motivation, Salaries.
Identifiers: Commuters.

The report provides an evaluation of the labor resource base of north-central New Mexico to further the development of alternative regional economic development patterns. The first section gives explanation of the procedures utilized in projecting numbers of willing commuters, at alternative wage rates, to employment opportunities in north-central New Mexico. The second section presents tables listing the number of persons willing to commute from various census geographic units for alternative wage rates, as well as maps indicating labor availability through commuting within the major market areas surrounding the six principal urban areas in the region. The results of the report indicate an extremely mobile labor force in north-central New Mexico.

PB-223 604/0GA PC$3.50/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.
TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME A. INTRODUCTION AND DIRECTIONS FOR USING THESE GUIDELINES,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 57p* APTD-1573
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Personnel development, Personnel selection, State government, Local government, Qualifications.
Identifiers: Government agencies.

Information was developed to assist in solving staffing and training problems; it consists of descriptions of tasks typically performed in a comprehensive air pollution control agency, including staffing guidance relevant to each task; and descriptions of categories of personnel, members of which are suited to learn to perform specific agency tasks. (Author)

PB-223 605/7GA PC$4.25/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.
TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME B. DETAILED TASK DATA, AND STAFFING GUIDANCE. ENGINEERING SERVICES,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 120p* APTD-1574
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Job analysis, Engineers, State government, Local government, Qualifications, Personnel selections, Inspection.
Identifiers: Tasks, Government agencies.

Task data and staffing information are presented covering a group of related tasks which are typically performed within the engineering organization of a control agency. The operations are performed by the occupational categories of Engineer and Engineering Technician. The following tasks are included: Development and production of an emission inventory; reception and preliminary screening of plan review/permit system applications and supporting materials; review of plans and application forms in a plan review/permit system; engineering inspection; design and construction of an episode control system; and review of application for tax exemption on air pollution control equipment. Other engineering tasks which have been identified but which have not yet been submitted to detailed analysis are tabulated. Occupational categories have been suggested for each task based upon current knowledge of the skills and knowledge required to perform them effectively. A brief rationale for each assignment is also included in the table. (Author)

PB-223 606/5GA PC$3.50/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.
TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME C. DETAILED TASK DATA, AND STAFFING GUIDANCE. FIELD ENFORCEMENT,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 61p* APTD-1575
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Qualifications, Job analysis, Local government, State government, Law enforcement, Inspection.
Identifiers: Government agencies.

Task data and staffing guidance are presented covering a group of related tasks which are typically performed within or in support of the field enforcement efforts of an agency. The operations are performed by members of the occupational category of Field Enforcement Officer. The following tasks are included: Routine inspection; complaint investigation; patrol of assigned areas or routes and citation of violators of air pollution control regulations; assist the legal staff in preparation of enforcement actions; serving as a witness in court or at a hearing; and organization and operation of a smokeschool. (Author)

PB-223 607/3GA PC$3.75/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.
TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME D. DETAILED TASK DATA, AND STAFF GUIDANCE. LABORATORY SUPPORT,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 76p* APTD-1576
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Chemists, Job analysis, Gas analysis, Qualifications, State government, Local government, Chemical analysis.
Identifiers: Government agencies.

Task data and staffing guidance are presented covering a group of tasks which are generally performed by a chemical analysis laboratory in support of the agency's air monitoring and source testing efforts. The tasks include standard chemical analyses, equipment maintenance, supervision, and development of new methods. The operations are performed by chemists, chemical laboratory technicians, and equipment technicians.

PB-223 608/1GA PC$4.25/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.

TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME E. DETAILED TASK DATA, AND STAFFING GUIDANCE. AIR MONITORING AND METEOROLOGICAL SUPPORT,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 108p* APTD-1577
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Job analysis, Chemists, Scientists, Qualifications, Monitors, Maintenance, Chemical analysis, Gas analysis, State government, Local government.
Identifiers: Government agencies.

Task data and staffing guidance are presented covering a group of tasks relevant to the monitoring of ambient air quality conditions and the effects of meteorological conditions on air quality. The tasks described here are performed by equipment technicians, chemists, meteorologists, and meteorological technicians.

PB-223 609/9GA PC$3.50/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.
TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME F. DETAILED TASK DATA, AND STAFFING GUIDANCE. SOURCE TESTING,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 55p* APTD-1578
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Job analysis, Engineers, Qualifications, Tests, State government, Local government, Inspection.
Identifiers: Government agencies.

Task data and staffing guidance are presented covering tasks which are generally performed by Engineers or Equipment Technicians in connection with the agency's source testing effort. The tasks deal with both stationary and mobile sources. This volume covers: Performance of a stack test; managing a stack test; determination of odor concentration in the atmosphere or in stack emissions; performing a used car inspection; performing the idle and acid tests; planning the dynamometer installation; operation and maintenance of the engine dynamometer; and operation and maintenance of the chassis dynamometer. (Author)

PB-223 610/7GA PC$4.25/MF$1.45
Applied Science Associates, Inc., Valencia, Pa.
TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES. VOLUME G. DETAILED TASK DATA, AND STAFFING GUIDANCE. AGENCY MANAGEMENT, PROGRAM DEVELOPMENT, AND PUBLIC INFORMATION SUPPORT,
K. I. Rifkin, R. L. Dueker, W. F. Diggins, F. C. Foss, and Michael Senew. Nov 72, 101p* APTD-1579
Contract EPA-68-02-0306
Paper copy also available from NTIS $19.00/set of 7 reports as PB-223 603-SET.

Descriptors: (*Air pollution, *Personnel management), Job analysis, Decision making, Local government, State government, Qualifications.
Identifiers: Government agencies.

Task data and staffing information are presented covering a group of tasks which are related to agency management and high level problem solving. The operations are performed by the occupational categories of air pollution control director, resources administrator, program planning and development specialist, and public information specialist. The following tasks are included: High level agency management; agency resources management; technical management; literature review and data summary regarding ambient air quality standards; development of new or modified regulations; support of development of local control programs; and preparation of a public information presentation. (Author)

PB-223 616/4GA PC-GPO/MF$1.45-NTIS
National Science Foundation, Washington, D.C. Div. of Science Resources Studies.
SCIENTIFIC HUMAN RESOURCES: PROFILES AND ISSUES.
Science personnel study rept. 1960-72,
Charles E. Falk. 1972, 38p NSF-72-304
Errata sheet inserted.
Paper copy available from GPO $0.25 as NSi.2:SCI.2/22.

Descriptors: (*Scientists, *Supply(Economics)), (*Manpower, Forecasting), United States, Utilization, Employment, Unemployment, Mobility, Pattern recognition, Classifications, Shortages, Surpluses.
Identifiers: Underemployment, Emigration, Immigration.

Present day concern with American scientific manpower is a relatively new phenomenon in that it involves oversupply. The situation reflects a significant change in both potential supply and actual utilization, and unemployment and underemployment have become increasingly important issues. The immediate future cannot change much from the present situation unless an unexpected and marked deviation in emigration/immigration patterns occurs. Some long-range projections (to 1980) show some shortages for chemists and physicists, and oversupply of mathematicians and life sciences. These projections are based on past trends, and result from assumptions and methodologies.

PB-223 629/7GA PC$7.50/MF$1.45
California Univ., Santa Barbara. Inst. for Applied Behavioral Science.
BEHAVIOR MODIFICATION AND CORRECTIONS: CURRENT STATUS AND FUTURE POTENTIAL.
Final rept.,
Janis Costello. Dec 72, 107p
Contract LEAA-NI-72-006

Descriptors: (*Criminology, *Rehabilitation), (*Behavior therapy, Prisoners), Reviews, Conditioning(Learning), Project planning, Methodology, Research, Requirements, Theories.
Identifiers: Behavior modification, Correctional systems, Shortcomings, Criminal justice, Prison inmates.

The paper presents a comprehensive state-of-the-art review of the use of behavior modification techniques in the field of corrections. It discusses and critiques a number of research projects in behavior modification. The author notes shortcomings in this type of research such as ill-defined program goals, inconsistent program implementation, and lack of adequate follow-up on persons released from the programs. He observes that behavior modification shows great promise for the future as an instrument of correctional change, provided the research efforts are rigorous in methodology and systematically replicated, and provided that knowledge gained through these studies is widely disseminated. Portions of this document are not fully legible.

PB-223 717/0GA PC$3.00/MF$1.45
Dunlap and Associates, Inc., Darien, Conn.
BASIC TRAINING PROGRAM FOR DRIVER IMPROVEMENT ANALYST.
Final rept. 28 Jun 72-28 Jun 73,
Allen Hale. Aug 73, 43p* ED-73-9 DOT-HS-800 913
Contract DOT-HS-099-2-474

Descriptors: (*Motor vehicle operators, Improvement), (*Behavior, Correction), (*Specialized training, Instructors), Motor vehicle accidents, Traffic regulations, Traffic safety, Education, Projects, Documents, Reading, Recommendations, Psychology, Law(Jurisprudence), Communicating.
Identifiers: *Problem drivers, *Driver improvement, Traffic violations, Rules of the road.

The report briefly summarizes the steps taken to develop a basic training program for driver improvement analyst. Various enroute analytical products are appended including training requirements analysis, the course outline, organization of training modules, and training objectives. Recommendations for further efforts are also presented.

PB-223 744/4GA PC$4.50/MF$1.45
Massachusetts Univ., Amherst.
DEVELOPMENT OF A TWO TERM SEQUENCE OF MATERIALS COURSES FOR MECHANICAL ENGINEERING STUDENTS.
Final rept.,
John E. Ritter, Jr. Jun 73, 129p NSF-GY-4709
Grant NSF-GY-4709

Descriptors: (*Mechanical engineering, *Training devices), (*Materials, *Engineering education), Universities, Structural analysis, Mechanical properties, Processing, Utilization, Experimental data, Students, Massachusetts.
Identifiers: Classroom demonstrations, Visual aids.

A new two term sequence of materials courses, developed for mechanical engineering undergraduates at the University of Massachusetts, is described. The basic approach is to emphasize in a unified manner the interrelationships between structure, properties, and processing that must be considered for the effective utilization of materials. Details of course content, laboratory experiments, classroom demonstrations, and visual aids are given.

PB-223 749/3GA PC$4.75/MF$1.45
Abt Associates, Inc., Cambridge, Mass.
APPLICANT SERVICES IN COMO: ANALYSIS OF DATA FROM THE U.S. TRAINING AND EMPLOYMENT SERVICE APPLICANT FOLLOW-UP SURVEY (COMO DATA ANALYSIS).
Final rept. 1970-72.
3 Jul 73, 168p MEL-74-02
Contract DL-83-25-72-07

Descriptors: (*Employment, *Services), (*Organizing, *Manpower utilization), Placement, Evaluation, Data acquisition, Municipalities, Requirements, Impact, Productivity, Analysis of variance, Effectiveness.
Identifiers: *Comprehensive model for local office reorganization, *Employment services.

The study evaluates services provided to job-applicants by the 'COMO' (Comprehensive Model) model Employment Service Offices. One-month follow-up data was collected on samples of ES applicants in 6 COMO cities and 3 non-COMO cities at different points in time for analysis. Analysis was based on measures of applicant need, impact on applicants, and staff productivity. The study was structured to answer such questions as, how does COMO performance compare with non-COMO performance; what is the pattern of service area impact on applicants, applicant job-readiness, and staff productivity and what is the relative COMO impact for different target groups.

PB-223 779/6GA PC$5.25/MF$1.45
Multi-Racial Corp., Washington, D.C.
MANPOWER DATA SOURCES HANDBOOK FOR MANPOWER PLANNING AND EVALUATION.
Final rept. 1972-1973,
Vera Berkman, Marie Nahikian, Carolyn Farrow, Evelyn L. Canada, and Cleomine B. Lewis. Jul 73, 191p* MEL-73-14
Contract DL-83-11-72-15

Descriptors: (*Manpower utilization, *Planning), (*Manpower, Sources), Information systems, Handbooks, Evaluation, Data processing, Projects, Populations, Reference groups, Industrial relations, Mathematical prediction, Economic analysis, Statistical data.
Identifiers: Cooperative area manpower planning system, Revenue sharing, Labor market.

The handbook presents an extensive listing and description of public and private data sources containing relevant information for manpower planning and evaluation. For each data source, there are summaries of the data as well as publication and ordering information. Two indexes help the reader find the data sources: one is arranged alphabetically, the other by subject area. Also included is a section offering some practical guidelines for making effective use of the Handbook, particularly to meet cooperative area manpower planning system (CAMPS) and revenue sharing needs.

PB-223 802/0GA PC$14.00/MF$1.45
Bio-Dynamics, Inc., Cambridge, Mass.
A STUDY AND REFINEMENT OF THE POLICE RECRUITMENT AND SELECTION SYSTEM (COMMONWEALTH OF MASSACHUSETTS). VOLUME I. PATROLMAN JOB ANALYSIS.
Final rept.,
Charles Budrose, Marcellus Holmes, III, Barbara Berns, Maurice F. O'Shea, and Benjamin C. Duggar. Dec 71, 240p CSC-71-265

Descriptors: (*Police, *Job analysis), (*Law enforcement, *Recruiting), Personnel selection, Criteria, Classifications, Policies, Urban areas, Rural areas, Recommendations, Questionnaires, Massachusetts.
Identifiers: Police patrols.

The study makes an occupational analysis of the police patrol function (the entry-level position in the police career ladder), an examination of existing police selection criteria and process, and an examination of applicant recruitment practices, to serve as the basis of a revision of the police recruitment and selection system in Massachusetts. Functions of the police patrolman are divided into the categories of order maintenance, law enforcement, and public service; and a framework developed for delineating personal qualities, knowledge, and skills necessary to successful job performance.

RISO-M-1582/GA PC$5.75/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
STUDY OF MENTAL PROCEDURES IN ELECTRONIC SHOOTING.
J. Rasmussen, and A. Jensen. Feb 73, 71p
U.S. Sales Only.

Descriptors: (*Electronic equipment, *Repair), (*Personnel, *Performance testing).

For abstract, see NSA 28 02, number 05058.

5J. Psychology (Individual and Group Behavior)

AD-267 652/6GA PC$6.50/MF$1.45
Disaster Research Group (NAS-NRC), Washington, D.C.
FIELD STUDIES OF DISASTER BEHAVIOR. AN INVENTORY.
1961, 89p Disaster Study-14, NAS-NRC-Pub-886
Contract CD-SR-58-70
Distribution Limitation now Removed.
Also available in 35mm microfilm $1.45.

Descriptors: (*Disasters, Behavior), (*Behavior, *Bibliographies), Reviews, Epidemiology, Aviation accidents, Snowstorms, Regions, Earthquakes, Volcanoes, Earth movements, Explosions, Fires, Floods, Hurricanes, Damage, Typhoons, Toxicity, Mines(Excavations), Tornados, Bombing.

The document provides a relatively complete list of the field studies on human behavior in disasters that have been conducted by behavioral scientists. It is intended to assist research personnel, administrators, and others interested in disaster research findings in the identification and location of pertinent reports and other research products. Emphasis in the Inventory is primarily on studies of peacetime disasters affecting civilian groups and populations. It catalogs 114 field studies of human behavior in 103 different disaster situations. It provides a brief description of each event; the date, location, and damage produced; the number of interviews obtained in the study; the agency and personnel responsible for the research; and a list of the pertinent published and unpublished reports.

AD-767 184/3GA Reprint
John B Pierce Foundation Lab New Haven Conn
STUDIES OF SPECTRAL SENSITIVITY AS MEASURED BY A PROCEDURE OF FLICKER THRESHOLD,
Marc H. Bornstein, and Lawrence E. Marks. May 73, 8p AFOSR-TR-73-1624
Grant AF-AFOSR-1950-70
Revision of report dated 18 Dec 72.
Availability: Pub. in the American Jnl. of Optometry and Archives of American Academy of Optometry, v50 n5 p376-382 May 73.

Descriptors: (*Vision, Sensitivity), (*Visual perception, Thresholds(Physiology)), Spectra(Visible + ultraviolet), Psychophysics, Psychophysiology.
Identifiers: *Flicker, *Critical frequencies.

Subjects adjusted the radiance of monochromatic stimuli, modulated at constant frequencies, to produce just-detectable flicker. Experiment I showed that spectral sensitivity determined at frequencies 20-35 Hz matches CIE photopic luminous efficiency; higher frequencies (40-45 Hz) yielded reduced sensitivity to long wavelengths. Experiment II showed that increasing intensity alone narrows spectral sensitivity, whereas increasing frequency broadens it. Experiment III isolated three modulation-sensitive mechanisms by chromatic adaptation; these mechanisms have spectral sensitivities similar to Stiles' pi 1 pi 4, and pi 5. (Author)

AD-767 311/4GA PC$7.25/MF$1.45
Florida Univ Gainesville Coll of Business Administration
BLACK AND WHITE LEADERS USE OF BALES CATEGORIES IN RACIALLY MIXED GROUPS IN LABORATORY AND FIELD SETTINGS.
Technical rept.,
Walter A. Hill, John A. Ruhe, and William A. Allen. Sep 73, 105p Rept no. TR-73-2
Contract N00014-68-A-1073-0019
Prepared in cooperation with North Carolina Univ., Charlotte and Rhode Island Univ., Kingston.

Descriptors: (*Leadership, Analysis of variance), (*Sociometrics, *Group dynamics), Social psychology, Classification, Attitudes, Performance(Human), Game theory.
Identifiers: Biracial groups, Black white comparisons, Bales interaction process analysis categories, Socioeconomic status.

The paper provides information concerning black and white leaders use of the Bales categories in laboratory and field settings. Leaders' initiations were put into four variables: positive social emotional, directive, non directive, and negative social emotional acts. These initiations then were recorded as being directed to the leaders themselves, all group members, or individual group members. Separate analyses were run for the laboratory and field phases of the study and then the analyses were compared to discern whether differences discovered in the laboratory setting also occurred within the field setting. (Modified author abstract)

AD-767 347/8GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
A COMPARISON OF BLACK AND WHITE BOYS ON ATTITUDES TOWARD GUIDANCE AND ON COUNSELOR PREFERENCE BY RACE AND SEX.
Monograph,
George V. Ellis. 15 Mar 72, 52p

Descriptors: (*Students, Psychology), (*Attitudes, Students), Questionnaires.
Identifiers: Counseling.

The study investigated attitudes of black and white male students toward guidance and their preference for a counselor on the basis of race and sex. A random sample of 97 boys from two schools participated in the study. Five hypotheses were developed and the median test was performed and Chi-square subsequently used to test for null hypotheses of no difference in proportion between the two groups. (Modified author abstract)

AD-767 357/7GA PC$3.25/MF$1.45
Army War Coll Carlisle Barracks Pa
SUCCESSFUL ADOLESCENCE.
Monograph,
Jack D. Stevens. 1 Mar 72, 23p

Descriptors: (*Adolescents, Social psychology), Questionnaires.

The purpose of this monograph is to investigate why certain adolescents successfully make the transition from childhood dependence to the role of a full status adult. (Modified author abstract)

AD-767 366/8GA PC$2.75/MF$1.45
Rochester Univ N Y Management Research Center
BEHAVIOR IN GROUPS.
Final rept. 1 Sep 70-31 Aug 71,
Bernard M. Bass. 15 Sep 71, 6p
Contract N00014-67-A-0398-0002

Descriptors: (*Group dynamics, *Behavior), (*Management engineering, Scientific research), Culture, Attitudes, Data processing systems, Performance(Human), Statistical data, Students, Economics, Political science, Sociometrics.
Identifiers: Data banks, Foreign countries, Managers, Social scientists.

The report summarizes a year's work in continuing to build the International Research Group on Management data bank which grew from 30,000 to 42,000 cases from 40 countries. A parallel social and economic data bank of national statistics has also been assembled. (Author)

AD-767 383/3GA PC$4.25/MF$1.45
Baruch Coll New York
A STUDY OF THE SOCIAL PSYCHOLOGICAL CONSEQUENCES OF THE ANNOUNCEMENT TO CLOSE NAVAL SHIPYARDS. STUDY 1. RELATION OF PERSONALITY MEASURES TO JOB SATISFACTION AND COHESIVENESS ITEMS. STUDY 2. REPORTS OF PHYSICAL AILMENTS UNDER THREE CONDITIONS OF JOB STRESS.
Final rept.,
Sheldon S. Zalkind. Sep 73, 41p

Contract N00014-67-A-0365-0001

Descriptors: (*Social psychology, *Shipyards), (*Industrial psychology, *Stress(Psychology)), Job analysis, Industrial medicine, Personality tests, Manpower studies.
Identifiers: *Job satisfaction, Correlations, Shutdowns, Displacement, Health.

Two small studies used data from civilian employees of three naval shipyards: Brooklyn, New York, Portsmouth, New Hampshire, and Norfolk, Virginia. In study one, the relationships were slight of personality to job satisfaction and cohesiveness. For the yards, only the anomie measure showed some (low) consistency. In study two, contrary to expectations, the results showed more reports of ailments from the Norfolk (no stress) group than from the Portsmouth or Brooklyn longitudinal subsamples. A discussion is also included concerning dilemmas about definitions and taxonomies for stress, and some final points on the data from the project. (Author)

AD-767 384/1GA PC$3.00/MF$1.45
Baruch Coll New York
A STUDY OF THE SOCIAL PSYCHOLOGICAL CONSEQUENCES OF THE ANNOUNCEMENT TO CLOSE NAVAL SHIPYARDS. A SUBJECTIVELY EXPECTED UTILITY MODEL WITH MODERATOR VARIABLES IN RELATION TO EMPLOYEE DECISIONS ON OPPOSITION TO A NAVY YARD CLOSING ANNOUNCEMENT.
Technical rept.,
Robert H. Flast, and Sheldon S. Zalkind. Aug 73, 42p Rept no. TR-5
Contract N00014-67-A-0365-0001
See also AD-767 383.

Descriptors: (*Social psychology, *Shipyards), Decision making, Probability, Manpower studies.
Identifiers: Subjective probabilities, *Job satisfaction, Shutdowns, Displacement.

The subjectively expected utility (SEU) model of decision making under uncertainty requires subjective probability and subjective value or utility variables. The study, using non-experimental survey data collected from civilian employees at the Brooklyn Navy Yard compares the obtained relationships among subjective probability, utility, and decision variables with those that might be expected by an SEU theorist. It was found that the utility, not the subjective probability, variable was significantly related to the decision variables for the total sample. Subjective probability and utility together were not significantly more related to the decision variables than utility along. A utility moderator variable and a subjective probability moderator variable were found to be helpful. A subsample was isolated in which utility and subjective probability together were significantly more related to some of the decision variables than either utility or subjective probability alone. (Author)

AD-767 426/0GA PC$3.00/MF$1.45
Oregon Research Inst Eugene
JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES.
Technical rept.,
Amos Tversky, and Daniel Kahneman. Aug 73, 36p Rept no. Research Bull-Vol-13-n1
Contract N00014-73-C-0438, ARPA Order-2449

Descriptors: (*Decision making, *Uncertainty), (*Reasoning, Performance(Human)), Psychometrics, Decision theory.
Identifiers: Heuristic methods, Bias, Psychological tests.

The paper describes three heuristics, or mental operations, that are employed in judgment under uncertainty. The first is an assessment of representativeness or similarity which is usually performed when people are asked to judge the likelihood that an object or event A belongs to a class or process B. The second is an assessment of the availability of instances or scenarios, which is often employed when people are asked to assess the frequency of a class or the plausibility of a particular development. The third is an adjustment from a starting point, which is usually employed in numerical prediction when a relevant value is available. These heuristics are highly economical and usually effective, but they lead to systematic and predictable errors. A better understanding of these heuristics and of the biases to which they lead could improve judgments and decisions in situations of uncertainty. (Modified author abstract)

AD-767 447/6GA Reprint
California Univ Santa Barbara Inst of Environmental Stress
PERCEPTUAL AND METABOLIC RESPONSIVITY TO STANDARD BICYCLE ERGOMETRY FOLLOWING VARIOUS HYPNOTIC SUGGESTIONS,
William P. Morgan, Peter B. Raven, Barbara L. Drinkwater, and Steven M. Horvath. 23 Apr 71, 18p AFOSR-TR-73-1859
Grant AF-AFOSR-1653-69
Availability: Pub. in the International Jnl. of Clinical and Experimental Hypnosis, v21 n2 p86-101 1973.

Descriptors: (*Exercise, *Hypnosis), (*Endurance, Hypnosis), Physiology, Responses, Metabolism, Perception, Muscles, Psychophysiology.

Physiological assessments were made throughout the induction, explanation of work, exercise bout, and recovery period. The perceived exertion rating was made in the waking state following this 40-minute session. Analyses of variance for multifactor experiments with repeated measurements were performed, revealing that hypnotic suggestion evoked perceptual and physiological changes. It was concluded that complex somato-psychic phenomena govern perceptual and physiological responsivity to muscular exertion. (Modified author abstract)

AD-767 458/3GA PC$3.50/MF$1.45
Western Michigan Univ Kalamazoo
THE EFFECTS OF OBSERVING SUBJECT-INFLICTED AGGRESSION UPON SUBJECT'S AGGRESSIVE RESPONDING.
Technical rept.,
Roger Ulrich, Brigette Symannek, Sylvia Dulaney, and Lynn Peters. Dec 71, 29p Rept no. TR-10
Contract N00014-67-A-0421-0001

Descriptors: (*Reaction(Psychology), Motivation), Behavior, Perception(Psychology), Pain.
Identifiers: *Aggression.

Two male college students received nickels on a VI (variable-interval) reinforcement schedule for button pressing. Aggression was assessed through response rate changes during periods when responding concurrently with and independently of procuring reinforcement delivered aversive stimulation (foot shock) to an uninvolved organism (a rat) as compared to periods when button pressing did not deliver aversive stimulation. The occurrence of shock periods was randomized through an interval tape, and were signaled to the subject by rat-chamber illumination. The rat chamber was located at eye-level to the subject, and the behavior of the rat was clearly observable throughout the experiment. With some exceptions, button pressing rates were lower during shock than no-shock periods. Discontinuation of shock brought rate of responding during light-on periods close to that during light-off. Extinction brought rate of responding during shock-on periods close to that during no-shock periods. Increasing the intensity of shock increased suppression of responding during shock periods. (Modified author abstract)

AD-767 548/1GA PC$7.75/MF$1.45
Human Resources Research Organization Alexandria Va
COMPONENTS OF ORGANIZATIONAL COMPETENCE: TEST OF A CONCEPTUAL FRAMEWORK.
Technical rept. Jul 68-Jun 71,
Joseph A. Olmstead, Harold E. Christensen, and L. L. Lackey. Aug 73, 115p Rept no. HumRRO-TR-73-19
Contract DAHC19-73-0004

Descriptors: (*Military organizations, Effectiveness), (*Performance tests, *Military personnel), Leadership, Applied psychology, Simulation, Military psychology, Tests, Human engineering, Decision making.
Identifiers: Concepts, Organization theory.

The study was designed to identify and explore organizational processes critical to effective functioning and to determine how functioning of the processes is influenced by environmental pressures. A framework was developed based upon the concept of organizational competence and an adaptive-coping cycle consisting of seven critical processes. Ten twelve-man groups of experienced Army officers participated in an eight-hour role simulation of a light infantry battalion engaged in combat operations. Player communications were content-analyzed for quality of process performance, and the organizations' activities were evaluated for military effectiveness. It was concluded that organizational competence is a principal determinant of effectiveness, that an organization's ability to respond flexibly to pressures and changes in its environments is related to its competence, and that proficient performance of the identified processes improves effectiveness. (Author)

AD-767 621/6GA PC$3.25/MF$1.45
Army War Coll Carlisle Barracks Pa
LEADERSHIP FOR THE 1970'S.
Leadership monograph series.
Sep 73, 23p Rept no. Monograph-2
Report on Satisfaction with US Army Leadership.

Descriptors: (*Leadership, Officer personnel), Reviews, Army.

The purpose of the monograph is to present data associated with the general level of satisfaction with the overall performance of Army leaders. As was done in Monograph No. 1, 24 different groups of leaders will be investigated. Each of the four leadership modules (Field Grade Officer, Company Grade Officer, Senior NCO, and Junior NCO) is split into three categories on the basis of perspective (superior, self, and subordinate). These categories, in turn, are each split into two racial groups (white and non-white).

AD-767 622/4GA PC$3.00/MF$1.45
George Washington Univ Washington D C Dept of Statistics
TESTS FOR RECALL ABILITY.
Technical rept.,
M. A. Stephens. 1 Aug 73, 16p Rept no. TR-8
Contract N00014-67-A-0214-0015

Descriptors: (*Recall, *Psychometrics), (*Performance(Human), Memory), Test methods, Reliability, Reviews, Mathematical models, Groups(Mathematics).
Identifiers: Word lists, Abilities.

Two tests are discussed, for testing statistically whether a subject, given a list of words in mixed categories, tends to recall them in groups by category. One of the tests has already appeared in the literature, and some related mathematical results are given; it is suggested that there might be occasions when the other test is more appropriate for the problem. (Author)

AD-767 651/3GA PC$5.75/MF$1.45
Naval Postgraduate School Monterey Calif

AN ANALYSIS OF THE RELATIONSHIP BETWEEN STATE-TRAIT ANXIETY AND STUDENT NAVAL AVIATOR PERFORMANCE.
Master's thesis,
Jon David Holzapfel. Jun 73, 71p

Descriptors: (*Pilots, *Performance(Human)), (*Anxiety, *Learning), Students, Questionnaires, Psychometrics, Instructors.
Identifiers: Personnel selection.

To properly select individuals for flight training using anxiety as a predictor, it was necessary to investigate various aspects of anxiety. Initially, anxiety must be defined and its relationship to learning and task performance revealed. Additionally the effects of an instructor pilot known as a 'screamer' were analyzed. Empirical data was drawn from flight students at Patrol Squadron 31 using the State-Trait Anxiety Inventory and a supplementary questionnaire. Although no statistically significant correlations between state and trait anxiety and flight grades were revealed, the correlations were all negative as face validity would indicate. Additionally, of thirty-three students, all indicated the 'screamer' as a detriment to learning and task performance to various degrees. (Author)

5K. Sociology

COM-71-80013/GA PC-GPO/MF$76.85-NTIS
CENSUS OF POPULATION: 1970. DETAILED CHARACTERISTICS.
Final repts.
1972-73,53 issuesCENSUS-70-PC(1)-D01--
CENSUS-70-PC(1)-D53
Paper copy available from GPO $240.00/set of 53 reports as C3.223/8:970.

The reports present official 1970 statistics for detailed characteristics of the population for the states. The data are cross-classified by age, sex, and other characteristics and cover the following: nativity; place of birth; country of origin; parentage; citizenship; mother tongue; year moved into present house; residence in 1965; school enrollment; years of school completed; vocational training; veteran status; marital history; families and their composition; fertility; work disability; employment status; weeks worked in 1969; activity five years ago; place of work; occupation; industry; class of worker; income; and poverty status. In addition, for areas with Negro and/or Spanish population of specified size, the reports present selected data for these groups. For prices of individual reports, see below:
CENSUS-70-PC(1)-D01. United States Summary. Feb 73, 1178p, PC-GPO$7.25, MF$1.45-NTIS
CENSUS-70-PC(1)-D53. Puerto Rico. Apr 73, 846p, PC-GPO$4.75, MF$1.45-NTIS

COM-71-80017-02D/GA
PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SUBJECT REPORTS: LIFETIME AND RECENT MIGRATION.
Mar 73, 552p CENSUS-70-PC(2)-02D
Paper copy available from GPO $5.05 as C3.223/10:970/2D.

Descriptors: (*Census, *Population migrations), (*United States, Census), Tables(Data), Socioeconomic status, Education.

The report provides data on lifetime and recent migration for persons five years old and over in the United States. Detailed summary data are shown for persons five years old and over according to whether or not they were living in the state of birth in 1965 and 1970. Data are included for age, sex, race, Spanish heritage, years of school completed, enrollment status, relative progress in school, employment status, major occupation group, family income in 1969, and children ever born. Other tables show specific streams of movement in terms of State or division of residence in 1970, division of birth, by age, sex, and race of persons. Additional tables provide information on division of residence in 1965, and division of birth for persons 25 to 64 years old, cross-classified by age, sex, race, and years of school completed. Five appendixes in the report provide general information concerning the presentation, collection, and processing of data in the 1970 census.

N73-28942/3GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif. Inst. of Governmental Studies.
THE SOCIAL IMPACTS OF TECHNOLOGY: TOWARD AN ASSESSMENT OF STOL AIRCRAFT POTENTIAL.
Semiannual Report, 1 Dec. 1972 - 30 May 1973.
T. R. Laporte. 30 May 73, 26p NASA-CR-133356
Contract NGR-05-003-0471

Descriptors: *Short takeoff aircraft, *Social factors, *Technology assessment, Air transportation, Data processing, Rural areas.

For abstract, see STAR 1119

PB-223 587/7GA PC$2.75/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
CRIMINAL JUSTICE OBJECTIVES AND ACTIVITIES - DEFINITION AND ASSESSMENT OF HIGH PRIORITY NEEDS FOR IMPROVEMENT,
Fred W. Koehne, and William R. Partridge. Nov 71, 18p* CJP-71-6
Contract LEAA-NI-71-050-G

Descriptors: (*Criminal law, Evaluation), (*Public opinion, *Law enforcement), Improvement, Objectives, Questionnaires, Interviews, Planning.
Identifiers: Criminal justice.

The project solicited and correlated the opinions of people in regard to criminal justice improvement needs. Included are basic criminal justice objectives, assessment of priorities, and assessment of basic criminal justice activities. The pilot cities staff interviewed 100 persons for the project.

PB-223 657/8GA PC$6.50/MF$1.45
Inner City Fund, Inc., Washington, D.C.
EMPLOYER-SUBSIDIZED CHILD CARE.
Final rept.,
Donald G. Ogilvie. Jan 72, 279p* HEW-SRS-72-52

Descriptors: (*Industrial relations, *Benefit plans), (*Children, *Supervision), (*Fringe benefits, *Benefit cost analysis), Labor relations, Absenteeism, Recruiting, Family relations, Females, Economic analysis, Effectiveness, Surveys.
Identifiers: Day care, *Employer subsidized child care, Employed mothers.

The study entailed a survey and cost-benefit analysis of existing employer-subsidized day care programs in the United States. It was designed to assess the potential rationale for involvement in employer-subsidized child care from the limited perspective of the employer. The cost of day care appears to be highly sensitive to small changes in pupil/teacher ratios and underenrollment, and relatively insensitive to construction and food costs. There seems to be a question as to whether day care subsidies reduced worker turnover or absenteeism, but the recruiting value of subsidized day care, in terms of new employees, seems appreciable.

PB-223 658/6GA PC$3.75/MF$1.45
Indiana Organized Crime Prevention Council, Indianapolis.
A PRELIMINARY ASSESSMENT OF THEFT FROM BUSINESS IN INDIANA AND THE INVOLVEMENT OF ORGANIZED CRIMINAL ACTIVITY.
Research rept.
Jun 73, 86p*

Descriptors: (*Industries, Losses), (*Crimes, Statistical data), (*Indiana, *Criminal investigations), Construction industry, Transportation, Manufacturing, Insurance, Sales.
Identifiers: *Organized crime, Theft, Credit cards.

Information relating to the perceived seriousness of the theft problem, actual amount of the theft loss, nature of the theft loss and linkage of the theft problem to organized criminal activity in Indiana was sought via questionnaires to construction, wholesaling, retailing, and manufacturing industries with a net worth exceeding $500,000. The net worth criteria was not applied to the transportation, credit card or insurance industries. Statistical breakdowns by industry are reported as are summary statistics, predictions, and recommendations.

PB-223 734/5GA PC$3.75/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
A BASIC SELECTED BIBLIOGRAPHY OF CRIME AND DELINQUENCY,
Pedro R. David. Oct 71, 31p CJP-71-5
Grant LEAA-NI-71-050-G

Descriptors: (*Criminology, *Bibliographies), (*Juvenile delinquency, Bibliographies), Crimes, Law enforcement, Criminal law, Correction, Rehabilitation, Law(Jurisprudence).
Identifiers: Judicial processes, Correctional systems.

The report contains references pertaining to crime and delinquency prevention, corrections and rehabilitation, law enforcement, and the judicial process. The bibliography covers material up to 1971.

PB-223 756/8GA PC$3.75/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
A PROJECT FOR IMPROVING AND EXPANDING SERVICES FOR DISABLED HOMEMAKERS.
Final rept. 23 Jun 70-22 Jun 73,
William R. Phelps. 22 Jun 73, 33p
Grant SRS-25-65223

Descriptors: (*Handicapped workers, *Rehabilitation), (*Vocational guidance, *West Virginia), Projects, Reviews, Services, Community relations, Counseling, Specialized training, Public relations.
Identifiers: *Vocational rehabilitation, Monongalia County(West Virginia), Disabled persons, Homemaker services.

The primary mission was to vocationally rehabilitate disabled homemakers residing in Monongalia County, West Virginia and vicinity. Related purposes were to assist in strengthening the agency services for disabled homemakers statewide, make the public more aware of the needs of disabled homemakers and what can be done to help them, and to promote the development of needed community resources. During the tenure of the three-year expansion project, services were provided to 200 disabled homemaker clients directly or indirectly. The leading sources of referrals over the period were self-referrals, physicians, relatives, public health, and general hospitals.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-767 207/4GA PC$2.75/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
FREE 17-OHCS LEVELS IN PAROTID FLUID AS INDICATORS OF HYPERTHERMIC STRESS.
Technical rept.,
Marion T. Ulrich, and Abbott T. Kissen. May 73, 12p Rept no. AMRL-TR-73-3

Descriptors: (*Corticosteroid agents, High-temperature research), Body fluids, Saliva, Endocrine glands, Heat tolerance, Adrenal glands, Pituitary gland, Stress(Physiology), Biochemistry.
Identifiers: *Heat stress.

Physiologic parameters of rectal, skin, and body temperatures, body heat storage, heart rate, and parotid fluid 17-OHCS levels were obtained on human subjects during one hour hyperthermic exposures at 52C and 66C ambient air temperatures. Significant differences were noted between control and exposure values in all parameters (except parotid fluid 17-OHCS) where elevated responses correlated with duration and degree of thermal stress, reaching maximal values after 50 and 60 minutes of exposure. In the 17-OHCS response, fluctuations were observed for both the 66C and 52C exposures with primary peak elevations for each occurring at 20 minutes exposure and secondary peak elevations at 50 and 60 minutes, respectively. The parotid fluid corticosteroid level, with its shifting between normal and elevated values, is an unpredictable barometer of physiologic strain induced by heat stress. (Author)

AD-767 496/3GA Reprint
Princeton Univ N J Dept of Physics
RELATION BETWEEN STRUCTURE, COOPERATIVITY AND SPECTRA IN A MODEL OF HEMOGLOBIN ACTION,
John J. Hopfield. 11 Dec 72, 18p AFOSR-TR-73-1680
Contract F44620-71-C-0108
Availability: Pub. in Jnl. of Molecular Biology, n77 p207-222 1973.

Descriptors: (*Hemoglobin, Chemical reactions), Models(Simulations), Chemical bonds, Proteins, Chemical properties, Molecular properties.
Identifiers: Molecular biology.

A quantitative understanding of co-operativity in hemoglobin must include a description of where and how the free energy of co-operation is stored in the molecule. Experiments to date have not succeeded in associating this energy with a particular bond. One extreme possibility is that the free energy is stored as small amounts of strain energy in many bonds, so that all bonds are almost normal. A linear distributed energy model can be constructed when the strain energies of bonds are sufficiently small. This model relates quantitatively small structural changes at the heme group, upon ligation, to the free energy of co-operation, although the energy of co-operation is not chiefly stored at the heme group on this model. It is in accord with the non-co-operativity of the oxidation of hemoglobin(2+) - aquo-methemoglobin(3+) at pH 6, and describes the magnitude of changes observed in the Soret band when the quaternary structure is changed. It accounts for the scale of the motions in the heme region due to changes in the quaternary structure, and provides a framework for discussion of spectral and structural changes for affinity affectors which are not located near the heme group. The general model should be of use for discussing other cases of the control of local chemical properties by proteins. (Author)

CEA-CONF-2120/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Orsay (France).
DETERMINATION OF IODINE BY ACTIVATION IN THE THYROID FOLLICLES.
R. Riviere, G. F. Camuzzini, M. Girault, O. Stulzaft, and D. Comar. 1971, 14p CONF-721010-29
In French. U.S. Sales Only.

Descriptors: (*Thyroid, *Activation analysis), (*Iodine, Activation analysis), Iodine 127, Iodine 129, Man, Microanalysis, Multi-element separation, Neutron beams, Quantitative chemical analysis, Sample preparation, Thermal neutrons.

For abstract, see NSA 28 03, number 05088.

CONF-721010-41/GA PC$3.00/MF$1.45
Technical Univ. Of Budapest (Hungary).
INVESTIGATIONS ON THE PREPARATION AND APPLICATION OF SOME INORGANIC SEPARATORS FOR THE REMOVAL OF THE MATRIX ACTIVITY IN NEUTRON ACTIVATED BIOLOGICAL SAMPLES.
L. G. Nagy, G. Toeroek, G. Foti, T. Toth, and L. Feuer. 1972, 10p
U.S. Sales Only.

Descriptors: (*Blood, *Activation analysis), (*Manganese, Activation analysis), (*Cobalt, Activation analysis), (*Copper, Activation analysis), Adsorbents, Adsorption, Antimony oxides, Biological materials, Chromatography, Comparative evaluations, Multi-element separation, Neutron beams, Phosphates, Phosphorus 32, Potassium 42, Sodium 24, Thermal neutrons, Titanium compounds, Zirconium compounds, Accuracy, Distillation, Ion exchange, Iron, Sensitivity, Zinc.

For abstract, see NSA 28 03, number 05089.

CONF-730509-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
USE OF SEQUENTIAL COLUMNS OF MICRORETICULAR AND PELLICULAR ION EXCHANGE RESINS IN THE HIGH-RESOLUTION SEPARATION OF COMPLEX BIOCHEMICAL MIXTURES.
C. D. Scott, and N. E. Lee. 1973, 19p

Descriptors: (*Body fluids, *Ion exchange), Biological materials, Extraction columns, Ion exchange materials, Resins, Separation processes.

For abstract, see NSA 28 03, number 07689.

COO-2101-13/GA PC$3.00/MF$1.45
Michigan Univ., Ann Arbor. Dept. Of Biological Chemistry.
SYNTHESIS OF DNA CONTAINING URACIL OR 5-HYDROXYMETHYLURACIL DURING BACTERIOPHAGE INFECTION OF BACILLUS SUBTILIS. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
A. R. Price. 1973, 8p
Contract AT(11-1)-2101

Descriptors: (*Dna, *Biosynthesis), Actinomycin, Antibiotics, Bacillus subtilis, Bacteriophages, Organic acids, Uracils.

For abstract, see NSA 28 03, number 07700.

COO-2101-14/GA PC$3.00/MF$1.45
Michigan Univ., Ann Arbor. Dept. Of Biological Chemistry.
SYNTHESIS OF DNA CONTAINING URACIL OR 5-HYDROXYMETHYLURACIL DURING BACTERIOPHAGE INFECTION OF BACILLUS SUBTILIS. COMPREHENSIVE REPORT, MAY 1, 1970--JULY 31, 1973.
A. R. Price. 1973, 6p
Contract AT(11-1)-2101

Descriptors: (*Dna, *Biosynthesis), Bacillus subtilis, Bacteriophages, Enzymes, Mutants, Uracils.

For abstract, see NSA 28 03, number 07701.

COO-3120-4/GA PC$4.75/MF$1.45
Princeton Univ., N.J. Joseph Henry Labs.
BIOLUMINESCENT SPECTRA OBSERVED IN VIVO BY MEANS OF AN IMAGE INTENSIFIER SPECTROMETER. TECHNICAL REPORT 15.
G. T. Reynolds. 23 Jan 73, 52p
Contract AT(11-1)-3120

Descriptors: (*Biological materials, *Luminescence), Emission spectra, Image intensifiers, In vivo, Optical spectrometers.

For abstract, see NSA 28 03, number 07707.

COO-875-155/GA PC$3.00/MF$1.45
Utah Univ., Salt Lake City.
ENERGY TRANSFER MECHANISMS IN PHOTOBIOLOGICAL REACTIONS. TECHNICAL PROGRESS REPORT, AUGUST 1, 1972--APRIL 30, 1973.
J. D. Spikes. 1 May 73, 8p
Contract AT(11-1)-875

Descriptors: (*Biochemistry, *Photochemistry), Energy transfer, Eosin, Heme, Isoalloxazines, Methionine, Oxidation, Porphyrins, Proteins, Sensitivity, Tyrosine.

For abstract, see NSA 28 03, number 07693.

FRNC-TH-322/GA PC$15.75/MF$1.45
Paris Univ., Orsay (France).
CARBON-14 LABELLED AMINOACIDS, AMINOKETOACIDS, AND AMINOKETONES OF INTEREST IN BIOLOGY.
J. P. Beaucourt. 1972, 274p
In French. U.S. Sales Only.

Descriptors: (*Amino acids, *Labelling), (*Carbon 14, *Isotopic exchange), Adrenal hormones, Amines, Aminolevulinic acid, Carbon 14 compounds, Chemical preparation, Esters, Keto acids, Ketones, Sympathomimetics.

For abstract, see NSA 28 03, number 05274.

JUL-917-RA/GA PC$8.50/MF$1.45
Kernforschungsanlage, Juelich (West Germany).
MOLECULAR BIOLOGICAL INVESTIGATIONS OF NUCLEIC ACID EXCHANGE IN THE CHICKEN EMBRYO AND ITS INTERFERENCE BY DDT.
K. J. Groneuer. Jan 73, 128p
In German. U.S. Sales Only.

Descriptors: (*Nucleic acids, *Molecular biology), (*Embryos, Nucleic acids), Chickens, Ddt, Inhibition.

For abstract, see NSA 28 02, number 05040.

ORO-3941-17/GA PC$3.00/MF$1.45
Duke Univ., Durham, N. C.
MECHANISMS OF RECOMBINATION AND FUNCTION OF DNA IN BACTERIA. PROGRESS REPORT, MAY 11, 1972--MAY 10, 1973.
W. R. Guild. 1973, 8p
Contract AT(40-1)-3941

Descriptors: (*Dna, Gene recombination), (*Gene recombination, *Bacteria), Dna-ase, Edta, Inhibition, Strand breaks.

For abstract, see NSA 28 02, number 05057.

ORO-3982-24/GA PC$3.50/MF$1.45
Florida Univ., Gainesville.

ENZYMATIC SYNTHESIS OF EUKARYOTIC NUCLEIC ACIDS. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
R. J. Mans. 1973, 29p
Contract AT(40-1)-3982

Descriptors: (*Rna, *Biosynthesis), (*Dna, Biosynthesis), Animal cells, Hela cells, In vitro, In vivo, Maize, Nucleotides, Plant cells, Transferases.

For abstract, see NSA 28 03, number 07761.

PB-223 724/6GA PC$2.75/MF$1.45
Pennsylvania Univ., Philadelphia.
EVALUATION OF THE SWEET-TASTING PROTEIN MONELLIN.
Annual comprehensive rept. 29 Jun 72-28 Jun 73,
Robert H. Cagan. 25 Jul 73, 13p* NIH-NIDR-72-2413
Contract PHS-72-2413

Descriptors: (*Proteins, Chemical properties), Amino acids, Chemical analysis, Ultraviolet spectra, Fluorescence, Emission spectra, Molecular weight, Electrical properties, Biochemistry.
Identifiers: Sweetening agents.

The aim of the described research was to biochemically characterize the sweet-tasting protein monellin. The molecular weight of purified monellin was determined, along with the isoelectric point, ultraviolet and fluorescence spectra, and amino acid composition.

RISO-275/GA PC$6.25/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
STUDIES ON THE MECHANISM OF FATTY ACID SYNTHESIS IN ANIMALS. THE CARBOXYLATION OF ACETYL-COA IN THE PRESENCE OF FATTY ACID SYNTHETASE.
H. J. M. Hansen. Oct 72, 82p
U.S. Sales Only.

Descriptors: (*Carboxylic acids, *Biosynthesis), Animals, Carboxylation, Synthetases.

For abstract, see NSA 28 02, number 05059.

SGAE-2102/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie, G.M.B.H., Seibersdorf. Institut fuer Biologie.
HYPOXANTHINE-QUANINE-PHOSPHORIBOSYLTRANSFERASE ACTIVITIES IN SOME PATIENTS WITH GOUT AND HYPERURICEMIA.
G. Partsch, O. Frank, and H. Altmann. Feb 73, 9p
U.S. Sales Only.

Descriptors: (*Transferases, *Inhibition), Biochemical reaction kinetics, Erythrocytes, In vitro, Metabolic diseases, Patients.

For abstract, see NSA 28 03, number 07780.

UCLA-34-P-102-36/GA PC$4.25/MF$1.45
California Univ., Los Angeles.
OCCURRENCE AND CHARACTERISTICS OF EXP 18 O-EXCHANGE REACTIONS CATALYZED BY SODIUM- AND POTASSIUM-DEPENDENT ADENOSINE TRIPHOSPHATASES.
A. S. Dahms, and P. D. Boyer. 1972, 43p
Contract AT(04-3)-34

Descriptors: (*Oxygen 18, *Isotopic exchange), Atp-ase, Catalysis, Chemical reaction kinetics, Potassium compounds, Sodium compounds, Water.

For abstract, see NSA 28 03, number 05275.

UCLA-34-P-102-44/GA PC$3.00/MF$1.45
California Univ., Los Angeles.
ISOTOPIC STUDIES ON STRUCTURE--FUNCTION RELATIONSHIPS OF NUCLEIC ACIDS AND ENZYMES. PROGRESS REPORT FOR THE PERIOD MAY 1, 1972--APRIL 30, 1973.
P. D. Boyer. 8p
Contract AT(04-3)-34

Descriptors: (*Cell membranes, *Energy transfer), (*Muscles, Energy transfer), (*Dna, *Molecular structure), (*Escherichia coli, *Dna replication), Oxygen 18, Phosphorus 32, Carbon 13, Tritium.

For abstract, see NSA 28 03, number 07805.

UR-3490-271/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
RATES OF EARLY EFFECTS OF GLUCOCORTICOIDS ON RAT THYMUS CELLS IN VITRO: A RATE HYPOTHESIS OF HORMONE-RECEPTOR COMPLEX ACTION.
C. Hallahan, D. A. Young, and A. Munck. 1972, 10p CONF-720633-3

Descriptors: (*Glucocorticoids, *Biological effects), (*Thymocytes, *Cell killing), Biosynthesis, Decay, Hydrocortisone, In vitro, Messenger-rna, Proteins, Rats.

For abstract, see NSA 28 03, number 07825.

UR-49-1460/GA PC$3.00/MF$1.45
Rochester Univ., N. Y.
POSSIBLE ROLE OF APATITE CRYSTALS IN THE ORIGINS OF LIFE.
W. F. Neuman. 1971, 8p CONF-711152-1

Descriptors: (*Apatites, *Catalysis), Adenine, Adenosine, Adsorption, Amino acids, Atp, Monomers, Nucleotides, Polymerization, Polymers.

For abstract, see NSA 28 02, number 05075.

UR-49-1463/GA PC$3.00/MF$1.45
Rochester Univ., N. Y.
SKELETON AS A CHEMICAL WAREHOUSE.
W. F. Neuman. 1971, 6p CONF-711152-2

Descriptors: (*Skeleton, *Chemical composition), Bone tissues, Crystal structure, Man, Microstructure, Minerals.

For abstract, see NSA 28 02, number 05076.

6B. Bioengineering

CONF-730434-1/GA PC$3.00/MF$1.45
International Atomic Energy Agency, Vienna (Austria).
STATUS REPORT: WHO/IAEA JOINT RESEARCH PROGRAMME ON TRACE ELEMENTS IN CARDIOVASCULAR DISEASES (AUTOPSY STUDIES: PROJECTS 1 AND 2).
R. M. Parr. 1973, 17p
U.S. Sales Only.

Descriptors: (*Cadmium, *Quantitative chemical analysis), (*Copper, Quantitative chemical analysis), (*Chromium, Quantitative chemical analysis), (*Molybdenum, Quantitative chemical analysis), Absorption spectroscopy, Activation analysis, Antimony, Arsenic, Autopsy, Bromine, Calcium, Cardiovascular diseases, Cerium, Cesium, Chemical analysis, Cobalt, Comparative evaluations, Gold, Heart, Iron, Kidneys, Lead, Liver, Magnesium, Manganese, Mercury, Multi-element analysis, Neutron beams, Potassium, Rubidium, Scandium, Selenium, Sodium, Trace amounts, Zinc.

For abstract, see NSA 28 03, number 05096.

N73-27947/3GA PC$3.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
SIMPLIFIED METHOD OF MULTIPLE IMPLANTATION OF ELECTRODES IN THE SUBCORTICAL STRUCTURES OF THE BRAIN.
V. N. Siderov. Aug 73, 8p NASA-TT-F-15001
Contract NASW-2482
Tran-Transl. Into English from Zh. Vysshei Nervnoi Deyatelnosti (Moscow), V. 15, No. 5, 1965 p 943-946.

Descriptors: *Brain, *Cats, *Electrodes, *Medical equipment, Bioelectric potential, Implantation.

For abstract, see STAR 1119

PATENT-3 744 480/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ERGOMETER.
Patent.
R. L. Gause, and B. G. Bynum. Patented 10 Jul 73, 8p NASA-CASE-MFS-21109-1,
Misc-Filed 29 Nov. 1971 Supersedes N72-20112 (10 - 11, p 1433).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Adaptive control, *Ergometers, *Loads (Forces), Cardiology, Man machine systems, Medical equipment, Patents, Physical work.

An ergometer is described that has a pedal driven direct current motor as a load and includes a frame for supporting the body of a person in either a sitting or a prone position. The pedals may be operated by either the feet or the hands. The electrical circuitry of the ergometer includes means for limiting the load applied to the pedals as a function of work being performed, heart rate, and increases in heart rate.

6C. Biology

AD-767 521/8GA PC$3.00/MF$1.45
Naval Oceanographic Office Washington D C
THE INFLUENCE OF HYDROLOGIC CONDITIONS ON THE DISTRIBUTION OF BALEEN WHALES IN THE ANTARCTIC (RASPREDELENIE USATYKH KITOV V ANARKTIKE V ZABISIMOSTI OT GIDROLOGICHESKIKH USLOVII),
E. I. Chernyi. 1973, 13p Rept no. NOO-Trans-567
Trans. of Tikhookeanskii Nauchno-Izzledovatelskii Institut Rybnogo Khozyaistva i Okeanografii. Izvestiya (USSR) v58 p223-228 1966, by V. Astvazaturov.

Descriptors: (*Cetacea, Distribution), (*Hydrology, Cetacea), Antarctic Regions, Plankton, Salinity, Ocean currents, USSR.
Identifiers: *Whales, Feeding habits, Translations.

Efficient whale hunting depends upon knowing where whale concentrations can be found. Baleen whale gather where their principal food (euphausiids) is plentiful. The Antarctic Convergence Zone is a consistently poor whaling area because cold Antarctic water plunges beneath warmer Sub-Antarctic water, inhibiting the growth of euphausiids. The best whaling regions are where the Antarctic Coastal and Circumpolar Currents meet. These are regions where a semistationary cyclonic system coincides with plankton rich waters upwelling from great depths. Whales locate these feeding grounds through salinity-sensing organs which direct them normal to surface water isohalines in search of the narrow range of salinity most favorable to plankton growth. They also travel parallel to isohalines to remain in the feeding grounds. (Author)

AEC-tr-7426/GA PC$5.75/MF$1.45
METHODS AND TECHNIQUE OF THE MACHINE ANALYSIS OF BIOLOGICAL STRUCTURES.
1972, 71p

Translation of Metody i tekhnika mashinnogo analiza biologicheskikh struktur, Nauka Press, Moscow, 1972.

Descriptors: (*Biological materials, Measuring methods), (*Measuring methods, *Automation), Chromosomes, Computers, Erythrocytes, Leukocytes, Yeasts.

For abstract, see NSA 28 03, number 07652.

COM-73-11442/3GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland. Div. of Management and Research.
COOS BAY RESOURCE USE STUDY (1971).
Rept. for 1 Mar-31 Oct 71,
Tom Gaumer, Darrell Demory, and Laimons Osis.
Mar 73, 30p NOAA-73082309
Contract DACW57-72-C-0138, Grant NOAA-043-208-55

Descriptors: (*Coos Bay, Fishing grounds), (*Fisheries, *Oregon), Recreation, Shellfish, Invertebrates, Marine fishes, Estuaries, Resources, Statistical data.
Identifiers: Sport fishing.

In 1971 the Fish Commission of Oregon studied the recreational use of marine food fish, shellfish, and miscellaneous invertebrates in Coos Bay, Oregon. Marine resources maps were prepared using information from this and previous Fish Commission studies. From March 1 through October 31, 1971, boat and shore anglers, tideflat users, and scuba divers were interviewed for catch, effort, and angler origin data. Analysis of the recreational data revealed that 67,900 resource user trips were expended in Coos Bay during the study. This came to 152,000 hours of effort. Anglers of the three fisheries harvested 416,000 animals. Crabs comprised 82% of the boat anglers catch with Dungeness crab the principal species caught. Finfish represented 62% of the shore angler's catch with shiner perch the most common species caught. Clams made up 91% of the tideflat users take. The gaper clam was the principal clam species dug while ghost shrimp was the major other invertebrate taken by tideflat users. 52% of the resource users for the three fisheries were from Coos County. (Modified author abstract)

COM-73-11513/1GA Reprint
Gulf Coast Research Lab., Ocean Springs, Miss.
SOME SPECIES OF LECITHASTER LUHE, 1901 (DIGENEA: HEMIURIDAE) AND RELATED GENERA FROM FISHES IN THE NORTHERN GULF OF MEXICO,
Robin M. Overstreet. 1973, 12p NOAA-73082916
Grant NMFS-2-85-R
Pub. in Transactions American Microscopical Society, v92 n2 p231-240 1973.

Descriptors: (*Trematoda, Fishes), (*Mexico Gulf, Trematoda), Estuaries, Identifying.
Identifiers: Hemiuridae, Mugil curema, Mugil cephalus, Lecithaster confusus, Lecithaster leiostomi, Lecithaster helodes, Hysterolecitha elongata, Aponurus pyriformis, Aponurus elongatus.

Lecithaster helodes n. sp. is decribed from Mugil curema and M. cephalus. It differs from the closely related L. mugilis Yamaguti, 1970 by having four rather than three ovarian lobes and other minor differences. Discussions and measurements are presented for L. confusus Odhner, 1905, L. leiostomi Overstreet, 1970, Hysterolecitha elongata Manter, 1931, Aponurus pyriformis (Linton, 1910) n. comb., and A. elongatus Siddiqi and Cable, 1960. Branchadena Linton, 1910 is considered a synonym of Aponurus Looss, 1907. New host records are listed for some of the above hemiurid trematodes. Leurodera ocyri Travassos, Frietas and Buhrnheim, 1965 and L. inaequalis Travassos, Freitas and Buhrnheim, 1965 are considered synonyms of A. pyriformis. (Author)

COM-73-11526/3GA PC$6.50/MF$1.45
New Mexico State Univ., University Park.
EFFECTS OF GILL NET MESH-SIZE AND COLOR, SEASONAL CONCENTRATIONS, AND BAITING ON CATCH RATES OF FISHES FROM ELEPHANT BUTTE LAKE, NEW MEXICO.
Master's thesis,
Gerald Lynn Wisdom. May 73, 87p NOAA-73082804

Descriptors: (*Fishing, Research), (*Fisheries, *New Mexico), Nets, Color, Equipment, Efficiency, Seasonal variations, Elephant Butte Lake, Theses.
Identifiers: Fish bait, Gill nets.

Objectives of research were to increase efficiency of fishing methods to catch more fish per unit of effort and to increase selectivity for and against various species. Experiments were carried out from 1966 to 1972, to increase efficiency and selectivity of gill nets. Five mesh sizes were tested for three years and none colors for one year each. Catch rates due to seasonal concentrations were determined from white control and colored test nets set in thirds of the lake during each season, and five baits were tested for one year. One combination of four and five-inch, stretchmesh, brown, commercial nets was fished in seasonal concentrations of river carpsucker for one year to determine cumulative effects of the three methods after it was determined that these mesh sizes and color, were most effective and that seasonal concentrations existed. (Modified author abstract)

COM-73-11539/6GA Reprint
Alabama Marine Resources Lab., Dauphin Island.
ALABAMA'S MARINE CAGE CULTURE STUDIES,
Wayne E. Swingle. 1972, 10p NOAA-73082915
Grant NMFS-2-86-R
Pub. in Proceedings of the Annual Workshop-World Mariculture Society (3rd), St. Petersburg, Fla., 26-28 Jan 72, p75-81.

Descriptors: (*Fishes, Aquaculture), Bass, Trout, Marine fishes, Brakish Water, Alabama.
Identifiers: Trachinotus carolinus, Mugil cephalus, Morone saxatilis, Salmo gairdneri.

The Alabama Department of Conservation and Natural Resources began studies on the cage culture of marine species in 1969. Major emphasis has been placed on the culture of pompano Trachinotus carolinus) because of its high value. Pompano were cultured to a maximum of 284 g average weight in one season. Pompano will have to be overwintered in the northern Gulf of Mexico. Pompano were acclimated to 0.2 ppt salinity. Mullet (Mugil cephalus stocked with pompano controlled fouling of cages. Facilities for culturing the fish are discussed. Other species successfully cultured in cages in the marine habitat include striped bass (Morone saxatilis) and rainbow trout (Salmo gairdneri). (Author)

COM-73-50809/5GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
FISHERY PUBLICATIONS, CALENDAR YEAR 1967: LISTS AND INDEXES.
Technical rept.,
Lee C. Thorson, and Mary Ellen Engett. Jul 73,
30p NOAA-TR-NMFS-Circ-381 NOAA-73080601
Paper copy available from GPO $0.35 as C55.13:NMFS-CIRC-381.

Descriptors: (*Fisheries, Bibliographies), Documents, Indexes(Documentation).

The following series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration (until October, 1970 the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service) in calendar year 1967 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: Circular, data report, fishery industrial research, fishery leaflet, and special scientific report - fisheries. (Author)

COO-3007-24/GA PC$3.50/MF$1.45
Delaware Univ., Newark. Dept. Of Chemistry.
BLUE-GREEN ALGAL GENETICS: A NEW METHODOLOGY.
M. P. Kraus. 1973, 27p

Descriptors: (*Viruses, *Biological radiation effects), Algae, Chromosomes, Gamma radiation, Gene recombination, Photon beams, Survival time.

For abstract, see NSA 28 02, number 02842.

COO-3016-1/GA PC$3.00/MF$1.45
Yale Univ., New Haven, Conn.
STUDIES ON MECHANISMS OF MUTATION, RECOMBINATION, AND GENE ACTION IN NEUROSPORA. FINAL TECHNICAL REPORT.
N. H. Giles. 1972, 6p
Contract AT(11-1)-3016

Descriptors: (*Neurospora, *Gene mutations), Crossing-over, Gene recombination, Genetic variability.

For abstract, see NSA 28 03, number 07704.

COO-3115-6/GA PC$3.00/MF$1.45
Columbia Univ., Irvington-on-Hudson, N. Y. Nevis Biological Station.
GENETICAL AND DEVELOPMENTAL STUDY OF A COMPLEX LOCUS IN THE HOUSE MOUSE. TECHNICAL PROGRESS REPORT.
L. C. Dunn, and D. Bennett. 1972, 4p
Contract AT(11-1)-3115

Descriptors: (*Mice, *Genetics).

For abstract, see NSA 28 02, number 05017.

LBL-1571/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
USE OF SYMBOLIC COMPUTER GRAPHICS IN DYNAMIC MODELS OF BIOLOGICAL SYSTEMS.
M. W. Horovitz. Jan 73, 4p CONF-730122-1
Contract W-7405-eng-48

Descriptors: (*Biological models, *Computer calculations), Biochemical reaction kinetics, Cell proliferation, Computer codes, Mathematical models, Metabolism, P codes, Physiology.

For abstract, see NSA 28 03, number 07740.

N73-27530/7GA PC$4.75/MF$1.45
Hosei Univ., Tokyo (Japan). Dept. of Geography.
STUDIES ON WIND-SHAPED TREES: THEIR CLASSIFICATION, DISTRIBUTION AND SIGNIFICANCE AS A CLIMATIC INDICATOR.
M. Yoshino. 1973, 52p CLIMATOL-NOTES-12

Descriptors: *Japan, *Microclimatology, *Trees (Plants), Bibliographies, Classifications, Ecology.

For abstract, see STAR 1118

N73-28854/0GA PC$3.00/MF$1.45
Martin Marietta Corp., Baltimore, Md. Research Institute for Advanced Studies.
A UNIFIED METABOLISM FOR MARS: A NEW APPROACH DEVELOPED FROM RESEARCH ON EXTRATERRESTRIAL LIFE DETECTION BY ENZYMATICALLY INDUCED EXCHANGE OF O 18.
Final Report, 5 Feb. 1971 - 30 Jun. 1972.
30 Jun 72, 19p NASA-CR-133186
Contract NASW-2182

Descriptors: *Bioassay, *Bioinstrumentation, *Extraterrestrial life, *Mars (Planet), Computer programs, Data acquisition, Enzyme activity, Life detectors.

For abstract, see STAR 1119

ORO-3883-4/GA PC$3.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. Of Microbiology.
STUDIES ON THE BIOCHEMISTRY OF DEVELOPMENT IN THE DIPTERA. FINAL REPORT.
W. J. Dobrogosz. 27 Feb 73, 8p

Descriptors: (*Insects, *Biochemical reaction kinetics).

For abstract, see NSA 28 03, number 07759.

PB-223 655/2GA PC$6.50/MF$1.45
Virginia Inst. of Marine Science, Glocester Point.
A CHECK LIST OF THE BIOTA OF LOWER CHESAPEAKE BAY.
Final rept.,
Marvin L. Wass. Oct 72, 299p VIMS-SSR-65
Grant NOAA-1-36037, NSF-GI-27323
Errata sheet included.

Descriptors: (*Aquatic animals, Classification), (*Chesapeake Bay, Aquatic animals), Fishes, Birds, Aquatic plants, Aquatic microbiology, Mammals, Taxonomy, Protozoa, Amphibia, Reptiles, Invertebrates, Vertebrates, Distribution(Property).
Identifiers: *Taxonomic keys, Biota.

The list is a sequel to the 'Check-list of Marine Invertebrates of Virginia' last revised in 1965. The biota of Chesapeake Bay seems generally less known than that of New England and much of our West Coast. The present work attempts to mollify this discrepancy. The compilation has been revised and expanded to include plants and vertebrates. Inclusion of creatures not strictly aquatic but which may occasionally find their areas flooded by tidal waters has necessitated subjective decisions of limitation. The revised version lists 1,171 plants, 1,005 invertebrates encompassing 9 protozoans, 124 parasites, 250 freeliving lower invertebrates and 540 higher invertebrates and 286 fish. Over 570 literature citations are provided.

PB-223 670-T/GA PC$15.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
A DISTRIBUTION LIST OF CHINESE BIRDS. VOLUME I. NON-PASSERIFORMES,
Cheng Tso-Hsin. 1973, 263p
Trans. of mono. Chung-Kuo Niao-lei Fen-pu Mulu, Peiping, v1 1955 p1-240. See also Volume 2, PB-223 671-T.

Descriptors: (*Birds, *China), Morphology, Taxonomy, Distribution(Property), Translations.
Identifiers: Ornithology.

The study attempts to collect all records pertaining to specimen collections and observations of birds seen in China (including the Province of Taiwan and various islands in the South China Sea) to which supplementary material obtained by this writer at museums inside and outside of China has been added, organized, and analyzed. The classification system used in this volume goes from order to species, then subspecies, based mostly on the book Birds of the Soviet Union (Ptitsi Sovetskogo Soyuza) written by Dement'yev and Gradkov and others, Vol 1-4 (1951-1952). Species listing is based chiefly on this author's writing (1947); subspecies listing follows geographical distribution, from west to east, and from north to south, in proper order. The genera, species, and subspecies listed are all supported by their original descriptions.

PB-223 671-T/GA PC$20.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
A DISTRIBUTION LIST OF CHINESE BIRDS. VOLUME II. PASSERIFORMES,
Cheng Tso-Hsin. 1973, 360p
Trans. of mono. Chung-Kuo Niao-lei Fenipu Mulu, Peiping, 1958 v2 1958. See also Volume 1, PB-223 670-T.

Descriptors: (*Birds, *China), Distribution(Property), Classification, Taxonomy, Translations.
Identifiers: *Passeriformes, Ornithology.

Birds belonging to Passeriformes are comprehensively arranged and analyzed according to their classification and distribution data. There are listed, under 28 families, 171 genera, 613 species, and 1,155 forms. In regard to the distribution data, besides specimens found in the museums of Leningrad of the USSR, Berlin of the Democratic German Republic, and New York of the USA, and in the Ornithological Specimen Room, Zoological Institute, Academia Sinica, relevant records are also synthesized herein. The 441 distribution maps in this book will help the reader comprehend the distribution ranges of, and mutual relationships among, certain species (or forms).

PB-223 672-T/GA PC$50.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
CHINA'S ECONOMIC FAUNA: BIRDS,
Cheng Tso-Hsin. 20 Mar 64, 968p
Trans. of mono. Chung-Kuo Ching-chi Tung-wu Chih - Niao Lei, Peiping, Mar 63 p1-694.

Descriptors: (*Birds, *China), Economics, Ecology, Distribution(Property), Classification, Taxonomy, Anatomy, Translations.
Identifiers: Ornithology.

A brief history of economic avifauna research in China, the economic significance, ecology, distribution, and classification of birds (with external features and measurements describing the body of the bird) are surveyed. The characteristics of each family are discussed separately under morphology, ecology, distribution, economic significance, etc., and an index for order classification is also listed. An appendix includes subjects such as the hunting and care of birds, the prevention and elimination of avian pests, the protection and attraction of beneficial birds, etc. A bibliography of references, indexes of Chinese names and Latin names, a list of terms describing the bird anatomy, photographic plates, etc., are also included. Portions of this document are not fully legible.

RLO-2221-T-2-14/GA PC$3.00/MF$1.45
Washington State Univ., Pullman. Dept. Of Agronomy and Soils.
MUTAGENIC INTERACTION OF SODIUM AZIDE ON MUTATIONS INDUCED IN BARLEY SEEDS TREATED WITH DIETHYL SULFATE OR N-METHYL-N'-NITROSOUREA.
C. F. Konzak, M. Niknejad, I. Wickham, and E. Donaldson. 1973, 14p
Contract AT(45-1)-2221

Descriptors: (*Barley, *Mutagenesis), (*Azides, *Genetic effects), Mutations, Nitrogen compounds, Nitroso compounds, Organic sulfur compounds, Seeds, Sodium compounds, Synergism.

For abstract, see NSA 28 03, number 07767.

RLO-2225-5-15/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Genetics.
PROBABILITY OF FIXATION OF A MUTANT WHEN SELECTION COEFFICIENTS VARY RANDOMLY WITH TIME.
J. Felsenstein. 1973, 18p
Contract AT(45-1)-2225

Descriptors: (*Mutants, *Genetic variability).

For abstract, see NSA 28 03, number 07769.

RLO-2226-T-1-11/GA PC$3.00/MF$1.45
Oregon Univ., Portland. Medical School.
STUDIES OF GENETIC ALTERATIONS OF HUMAN CELLS AND MOLECULES AND THE FACTORS INFLUENCING THEM. PROGRESS REPORT, AUGUST 1, 1972--APRIL 30, 1973.
6p
Contract AT(45-1)-2226

Descriptors: (*Phytohemagglutinin, *Biochemical reaction kinetics), (*Animal cells, *Genetic variability).

For abstract, see NSA 28 03, number 07770.

TID-26330/GA PC$4.25/MF$1.45
Louisiana State Univ., Baton Rouge. Dept. Of Chemistry.
PHYSICO-CHEMICAL STUDY OF SOME AREAS OF FUNDAMENTAL SIGNIFICANCE TO BIOPHYSICS. ANNUAL REPORT, 1972--1973.
S. P. McGlynn. 15 May 73, 43p
Contract AT(40-1)-3018

Descriptors: (*Biophysics, *Research programs).

For abstract, see NSA 28 03, number 07800.

6D. Bionics

AD-767 318/9GA PC$4.25/MF$1.45
General Technical Services Inc Upper Darby Pa
APPLICATION OF CYBERNETICS TO DECISION MAKING FOR PATTERN GENERATION DISPLAYS.
Rept. for 1 Jul-28 Sep 73,
A. Iberall, S. Cardon, and A. Schindler. Sep 73, 45p
Contract DAAK02-73-C-0439

Descriptors: (*Mine detectors, Target discrimination), (*Cybernetics, Mine detectors), (*Pattern recognition, Mine detectors), Time series analysis, Decision making, Information theory, Display systems, Sensors, Man-machine systems.

The purpose of the study was to learn what methodology cybernetics might have to offer mine detection. Namely, given a variety of sensor inputs from the changing images of a mine field being scanned, how might one augment the character of a display system in a cybernetic sense so as to enhance the capability of a man to detect mines. The report provides both a survey of pertinent cybernetic literature and an outline of relevant cybernetic principles drawn from the contractor's expertise in this field. (Author)

AD-767 379/1GA PC$13.50/MF$1.45
ESL, Inc., Sunnyvale, Calif.
STUDY OF ANIMAL SIGNALS AND NEURAL PROCESSING, WITH APPLICATIONS TO ADVANCED SONAR SYSTEMS.
Progress rept.,
Richard A. Altes. 10 Aug 73, 227p Rept no. ESL-PR115
Contract N00123-73-C-1144

Descriptors: (*Sound signals, Animals), (*Bionics, Sound signals), (*Information theory, *Sonar signals), Cetacea, Bats, Speech recognition, Psychoacoustics, Nerve cells, Fourier analysis, Transfer functions, Amplitude modulation, Auditory signals, Decoding, Band-pass filters.
Identifiers: *Animal communication, *Signal processing, Maximum likelihood estimation, Ambiguity functions, Neural nets, *Echolocation, Linear filtering.

The report begins with a summary of past results, along with some remarks that pertain to newer discoveries. An important new approach to the analysis of animal echolocation behavior is

presented in Section 3. The fourth and fifth sections consider likelihood ratio testing and signal to interference maximization as applied to a model of the animal sonar system. The sixth section describes some new results concerning bat signals. The seventh section describes an experiment that is presently being undertaken as a practical test of the theory. The eighth section describes two alternative models of the auditory system. The ninth section deals with the problem of minimizing the volume under the wideband ambiguity function. The mathematical processes involved in animal echolocation are intimately related to the processing of speech by the human auditory system. This relation is discussed and a new method of extracting information from speech is suggested. The Appendix includes some mathematical properties of the signals that have been derived to explain animal echolocation behavior.

N73-27936/6GA PC$6.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge.
ROBOT VISION.
Final Report.
L. L. Sutro, and J. B. Lerman. Apr 73, 78p NASA-CR-133458, R-635
Contract NSR-22-009-138

Descriptors: *Digital simulation, *Robots, *Stereoscopic vision, *Target recognition, Cameras, Cybernetics, Imaging techniques, Visual perception.

For abstract, see STAR 1119

6E. Clinical Medicine

AD-767 110/0GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
HYPERNATREMIC STATE IN HYPERMETABOLIC BURN PATIENTS,
Glenn D. Warden, Douglas W. Wilmore, Phillip W. Rogers, Arthur D. Mason, and Basil A. Pruitt, Jr. 15 Dec 72, 8p
Presented at the Annual Meeting of the Western Surgical Association (80th), Rochester, Minn., 16 Nov 72.
Availability: Pub. in the Archives of Surgery, v106 p420-427 Apr 73.

Descriptors: (*Burns, *Sodium), (*Electrolytes(Physiology), Burns), Blood serum, Blood chemistry, Metabolism, Diagnosis, Metabolic diseases.
Identifiers: Hypernatremia.

Fifty-one patients treated during the past 18 months, representing a total of 10.9% of the admissions to the burn unit, developed hypernatremia, with a serum sodium level above 145 mEq/liter; 60.8% of the patients had inadequate replacement of insensible fluid losses, and 31.3% of the cases developed hypernatremia during septic states. A small group of patients developed hypernatremia secondary to a solute diuresis with uncontrolled diabetes mellitus or supranormal caloric feedings. Two patients were identified with an apparent derangement in the antidiuretic hormone mechanism, and were treated by the administration of vasopressin injection (Pitressin). Clinical assessment, serial body weights, accurate fluid intake and output records, and laboratory monitoring are essential to the diagnosis and treatment of the hypernatremic state in hypermetabolic burn patients. (Author)

AD-767 112/6GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
CENTRAL VENOUS THROMBOSIS: A HAZARD OF MEDICAL PROGRESS,
Glenn D. Warden, Douglas W. Wilmore, and Basil A. Pruitt, Jr. 1973, 8p
Presented at the Annual Session of the American Association for the Surgery of Trauma (32nd), Held at San Francisco, Calif. 28-30 Sep 72.
Availability: Pub. in the Jnl. of Trauma, v13 n7 p620-626 Jul 73.

Descriptors: (*Thrombosis, *Veins), (*Cannulation, Veins), Parenteral infusions, Therapy, Burns, Septicemia, Embolism, Lungs, Surgery.

Autopsy reports of 139 burned patients who died during the period 1 January 1970 to 1 July 1972 were reviewed. Central venous thrombosis occurred in 36.7% of the autopsy cases, with 25 of 64 clots demonstrating suppuration. Pulmonary embolization occurred in 42 patients, and the source of the emboli was related to central venous thrombosis in three-fourths of the cases. Compared with previous studies of complications of intravenous therapy, there has been a sharp increase in central venous thrombosis and pulmonary embolization associated with more frequent use of central venous catheters. The clinical diagnosis of central venous thrombosis, both suppurative and bland, is extremely difficult, and must be suspected in cases of sepsis of unknown origin in the thermally injured patient.

AD-767 176/1GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
ANTIGENICITY OF A POLYSACCHARIDE VACCINE FROM NEISSERIA MENINGITIDIS ADMINISTERED INTRANASALLY.
Final rept.,
Richard P. Wenzel, John R. Mitzel, John A. Davies, Earl A. Edwards, and Carl Berling. 1 Mar 73, 13p
Availability: Pub. in the Jnl. of Infectious Diseases, v128 n1 p31-40 Jul 73.

Descriptors: (*Neisseria meningitidis, *Vaccines), (*Immunology, Neisseria meningitidis), Bacteria, Infectious diseases, Polysaccharides, Efficiency, Biological assay, Males, Antigens + antibodies.
Identifiers: *Meningitis.

Polysaccharide vaccine from group C Neisseria meningitidis was administered intranasally to three groups of approximately 20 men each. The antigen, 50 micrograms (groups I and II) or 200 micrograms (group III), was given in one dose, and the subjects were studied for approximately five weeks. Two weeks after vaccination titers of serum HA antibody to group C meningococci of greater than 1:8 were observed in 45%, 29%, and 70% of men in groups I, II, III, respectively. A rise in antibody after vaccination was also detected by the bactericidal test, but no detectable complement-fixing antibody developed. The intranasal vaccine did not produce significant rises in titer of local nasal antibody. Three weeks after vaccination with the 200 microgram dose (P = .029), fewer vaccinees than controls yielded group C organisms on culture. Comparison of vaccinees with natural carriers of meningococci showed that the antibody response to natural nasopharyngeal infection was approximately three times greater than that conferred by the 200 micrograms dose of vaccine. Although not recommended to replace the parenteral vaccine, intranasal vaccination offers a safe method for study of the pathogenesis of meninococcal infection and is the best model available to study the role of local antibody in immunity. (Modified author abstract)

AD-767 275/1GA PC$2.75/MF$1.45
Franklin Inst Research Labs Philadelphia Pa
DETECTION OF DRUGS BY AN ENZYME METHOD.
Final rept.,
Tamar Der O Hannessian. Aug 73, 23p Rept no. FIRL-F-C3538-01 LWL-CR-07B73
Contract DAAD05-73-C-0145

Descriptors: (*Cholinesterase inhibitors, Chemical analysis), (*Morphine, Chemical analysis), Cholinesterase, Fluorescence, Narcotics, Synthesis(Chemistry), Urine, Thin layer chromatography, Detection, Colorimetric analysis.
Identifiers: Spectroscopic analysis, *Heroin.

A study was conducted using the standard Army 'G' Agent Detector Kit, ABC-M30A1 as a means for detecting drugs (heroin). The objective of this study was to establish the sensitivity of the enzyme inhibition method for morphine detection and to determine a procedure for rapidly cleaving the glucuronide. (Modified author abstract)

AD-767 293/4GA MF$1.45
California Univ Berkeley School of Optometry
COMPUTER-CONTROLLED OPHTHALMIC REFRACTION.
Annual summary rept. no. 2, 1 Oct 72-30 Sep 73, Elwin Marg. 30 Jun 73, 34p
Contract DADA17-72-C-2044
See also Annual summary rept. no. 1, AD-745 921.
Availability: Available in microfiche only.

Descriptors: (*Ophthalmology, Computers), Refraction, Visual perception, Eye, Retina, Optics, Physiology, Computer programs.
Identifiers: Visual evoked responses, *Optometry, Computer aided control systems.

The basic design of the computerized subjective optometric examination should be flexible. There is a core group of tests that are given to most patients, but the tests that form this core can be different for each practitioner. It would seem ideal to collect a library of subroutines from which the practitioner could choose a core of tests which he finds most familiar or feels are the most reliable. This report deals with a small core which will be expanded in the future.

AD-767 341/1GA PC$3.00/MF$1.45
Oklahoma Univ Foundation Inc Oklahoma City Medical Center Research and Development Office
EVALUATION OF THE ROLE OF A MYOCARDIAL DEPRESSANT FACTOR IN SHOCK.
Technical rept.,
Lerner B. Hinshaw, Linda T. Archer, Megan R. Black, Ronald C. Elkins, and Lazar J. Greenfield. 8 Jun 73, 38p Rept no. TR-74
Contract N00014-68-A-0496

Descriptors: (*Heart, *Shock(Pathology)), (*Blood circulation, Shock(Pathology)), Physiology, Toxins + antitoxins, Dogs, Experimental data, Laboratory animals, Pancreas, Surgery, Blood pressure, Pathology.
Identifiers: Toxic shock, Endotoxins.

The purpose of the present study was to evaluate the role of a myocardial depressant factor (MDF) in shock. Experiments were carried out in dogs subjected to either splanchnic arterial occlusion (SAO) shock or endotoxin shock after pancreatectomy. An isolated heart monitored substances in blood released during SAO shock or was subjected to endotoxin shock during a 4-5 hour period. Afterload and cardiac output of the isolated heart were controlled or maintained constant. Results demonstrated normal myocardial performance of the test heart receiving blood from the splanchnic region after release of occlusion clamps during early and late phases of SAO shock. Hearts were observed to fail in animals acutely pancreatectomized and administered endotoxin while pancreatectomized controls exhibited normal myocardial performance. Pancreatectomy did not lessen the degree of heart failure after endotoxin. These findings fail to lend support for the MDF hypothesis but suggest a role of peripheral vascular factors in the pathogenesis of SAO shock and ascribe to as yet unknown mechanisms the precipitation of myocardial failure in endotoxin shock. (Author)

AD-767 344/5GA PC$2.75/MF$1.45
Oklahoma Univ Foundation Inc Oklahoma City Medical Center Research and Development Office
PATHOPHYSIOLOGICAL RESPONSE OF THE CANINE SPECIES IN 'ESCHERICHIA COLI' ENDOTOXEMIA.
Technical rept.,
James A. Shmidl, and Donald D. Holmes. 2 Jul 73, 23p Rept no. TR-77
Contract N00014-68-A-0496

Descriptors: (*Escherichia coli, Septicemia), (*Septicemia, Dogs), Shock(Pathology), Physiology, Pathology, Models(Simulations), Veterinary medicine, Toxins + Antitoxins.
Identifiers: *Toxemias, Endotoxins.

The pathophysiological effects of short-term septicemia and shock have been well documented in previous studies. The purpose of this research was to induce septicemia in a group of dogs with the use of live Escherichia coli organisms and extend the study over a 12-hour period of time. This period of time was in contrast to most previous studies which were conducted over a shorter time span. The live organisms were used rather than purified endotoxin so as to more closely approximate the clinical entity as seen in the human patient. In summation, there was a correlation of hemodynamic measurements, clinical pathological alterations and morphological changes of the lung during a 12-hour study of septicemic animals.

AD-767 436/9GA Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
'ONCHOCERCA VOLVULUS' AND 'WUCHERERIA BANCROFTI': FLUORESCENT ANTIBODY STAINING OF FROZEN HOMOLOGOUS SECTIONS FOR DIAGNOSIS,
David R. Ten Eyck. 4 Dec 72, 10p
Availability: Pub. in the Experimental Parasitology, v34 n1 p154-161 Aug 73.

Descriptors: (*Filariae, *Fluorescent antibody techniques), Serodiagnosis, Parasitic diseases, Antigen-antibody reactions.
Identifiers: *Onchocerca volvulus, *Wuchereria bancrofti, Onchocerciasis, Filariasis.

Antibody responses to two filarial diseases of man, onchocerciasis and bancroftian filariasis, were evaluated with the indirect fluorescent antibody technique (IFAT), using antigens derived from the appropriate etiologic agent. Antigenic preparations consisted of frozen cut sections of the adult Onchocerca volvulus and stage III larvae of Wuchereria bancrofti fixed to glass slides. Of 105 sera from individuals with biopsy-proven infections, 102 (97%) reacted with homologous O. volvulus antigen, and 19 of 22 (86%) with W. bancrofti antigen. In bancroftian filariasis, however, the homologously derived antigen was superior for diagnosis, and the highest seropositive rates occurred in acute, symptomatic infections. All such sera reacted with homologous antigen. In contrast, only 75% reacted with onchocercal antigen. Of those with chronic disease, characterized by long-standing elephantiasis or lymphedema without microfilaremia, 79% (22) were reactors to homologous antigen and 32% (9) to heterologous. The lowest seropositive rates occurred where microfilaremia was unaccompanied by local or systemic symptoms: 38% (3) were positive to homologous antigen and none to onchocercal antigen. (Modified author abstract)

AD-767 456/7GA PC$5.00/MF$1.45
Analytic Sciences Corp Reading Mass
THE PUBLIC HEALTH CRISIS: AN ANALYSIS OF THE RISING COST OF HEALTH CARE IN THE UNITED STATES.
Monograph,
Gerald S. Rose. 4 Feb 72, 59p

Descriptors: (*Medical examination, *Costs), Economics, Statistical data, Hospitals, Medical laboratories.
Identifiers: Medical services, Health care services.

The author compares the cost of living with the costs of health care in the United States. Discusses current health care delivery and explores future systems. The hypothesis developed is: as health care costs increase, the role of the public sector in health care delivery increases. Data was developed from academic journals, periodicals, government documents, and newspapers. Charts and graphs are used to summarize essential data. (Author)

AD-767 538/2GA PC$23.75/MF$1.45
Operations Research Group Edgewood Arsenal Md
THE EPIDEMIOLOGY AND ECOLOGY OF Q FEVER IN CENTRAL AND EASTERN EUROPE AND IN SOUTHEAST ASIA,
Harris J. Mark. Aug 73, 434p Rept no. ORG-54

Descriptors: (*Coxiella, *Epidemiology), (*Ecology, Coxiella), Southeast Asia, Eastern Europe, Serodiagnosis, Animals, Humans, Disease vectors, Rickettsiaceae, Ticks, Diptera.
Identifiers: *Q fever.

Nine countries of Central and Eastern Europe and five countries of Southeast Asia were investigated for the prevalence of Q fever. The disease is generally endemic and enzootic in Central and Eastern Europe, the evidence for this being substantial in Yugoslavia, Switzerland, Czechoslovakia, Romania, and Greece. The other four countries reviewed were Poland, Hungary, Albania, and Austria. A total of more than 5,178 cases (including 14 deaths) appeared in the nine European countries from 1943 through 1967 - a case rate of 0.48 per 10,000 population. The wildlife reservoir of infection in this region, which is generally considered to be a secondary source for man, also included three tick and two louse fly species. In Southeast Asia, only 170 cases (including 9 deaths) were reported from 1952 through 1964 in Malaya, Vietnam, Thailand, Ceylon, and India - a case rate of 0.004 per 10,000 population. Two tick species were also found to be infected. Human infection was regionally widespread in India, Thailand, and (perhaps) Malaya; wildlife appears to be the primary source of this infection in Malaya and perhaps Thailand. However, in view of the fact that no surveys of domestic animals have been carried out in Thailand, final opinion concerning the primary source of human infection in this country should be deferred. (Modified author abstract)

AD-767 587/9GA PC$2.75/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
VALIDATION OF AN ODDITY TASK FOR USE IN THE DIAGNOSIS OF COLOR VISION ANOMALIES.
Interim rept. Apr 72-Feb 73,
Robert G. Braun, and Genaro Leija. Aug 73, 17p
Rept no. SAM-TR-73-30

Descriptors: (*Color vision, Anomalies), Ophthalmology, Diagnosis, Visual acuity, Visual perception.

A procedure which measured a person's ability to discriminate the odd color from among three colors was compared against a clinical test commonly used in the diagnosis of color vision anomalies. Our purpose was to see if the oddity task, which monkeys can perform, could function as a substitute for the clinical diagnostic aid which can be administered only to humans. In every instance the diagnosis made from the results of the oddity task was identical to that made from the results of the clinical test. On the basis of these human data it was concluded that the results from a monkey's performance on the oddity task would be comparable to what would be obtained if the monkey were capable of taking the clinical test and, in turn, comparable to human data similarly obtained. The findings were discussed in relation to the use of animals as human surrogates. (Author)

AD-767 617/4GA PC$3.75/MF$1.45
Florida State Univ Tallahassee Dept of Statistics
NONPARAMETRIC TESTS OF INDEPENDENCE FOR CENSORED DATA WITH APPLICATION TO HEART TRANSPLANT STUDIES,
Byron W. Brown, Jr., Myles Hollander, and Ramesh M. Korwar. Sep 73, 31p Rept nos. FSU-Statistics-M272, TR-14 AFOSR-TR-73-1721
Grant AF-AFOSR-2581-74
Prepared in cooperation with Stanford Univ., Calif. Sponsored in part by Public Health Service.

Descriptors: (*Heart, Transplantation), (*Transplantation, Data), (*Statistical analysis, Transplantation), Biometry, Surgery, Survival, Analysis of variance.
Identifiers: Biostatistics.

The authors investigdate which variables are correlated with post-transplant survival length. Variables considered are sex, age, waiting time for donor, and date of transplant. These investigations lead to new nonparametric tests of independence for censored data. (Modified author abstract)

COM-73-50767/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTERMEDIARY BASE AND CEMENTATION.
Final rept.,
Nelson W. Rupp. 1973, 14p
Pub. in Operative Dentistry, 1973, p59-72.

Descriptors: (*Acid bonded reaction cements, *Dental materials), Physical properties, Reviews, Teeth, Tissues(Biology), Performance evaluation.
Identifiers: *Dental cements, Dental pulp, Dental prophylaxis.

The article reviews dental cements currently being used for intermediary bases and cementation. Clinical applications of the various cements are discussed relative to physical properties and biological response of tooth tissues. Some recently introduced materials are included.

COM-73-50787/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TYMPANIC CLINICAL TEMPERATURE.
Final rept.,
Maria Benzinger, and T. H. Benzinger. 1971, 14p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D. C., 21-24 Jun 71, 14p.

Descriptors: (*Body temperature, Measurement), Surgery, Clinical medicine, Anesthesiology, Hypothermia, Stress(Physiology), Thermoregulation, Measuring instruments.
Identifiers: Tympanic thermometry.

Tympanic thermometry, first introduced in physiology where it was instrumental in finding the mechanisms of human temperature regulation, has passed the test of application to clinical medicine. In the clinical situations thus far tested, which included anesthesia of various types, hypothermia for surgery, extreme heat and cold stress, extracorporeal circulation for open heart procedure and one case of terminal cooling toward exitum after stroke, tympanic and esophageal patterns were found identical for practical purposes. Rectal tracings deviated grossly from the significant central patterns which monitor the temperature of the heart, the brain and the centers of thermoregulation. These central patterns can now be conveniently obtained, by way of the tympanic approach, with clean disposable probes on awake patients, and without embarrassment, discomfort or airway interference, in hospitals or at home.

CONF-730332-1/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn. Tennessee Univ., Knoxville. Dept. Of Microbiology.
FETAL ANTIGENS IN NEOPLASIA.
M. G. Jr. Hanna, F. A. Salinas, and J. H. Jr. Coggin. 1973, 34p

Descriptors: (*Man, *Carcinogenesis), (*Fetal membranes, *Antigens), Immune reactions.

For abstract, see NSA 28 03, number 07684.

COO-2269-1/GA PC$3.00/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Radiology.
KINETIC AND BIOCHEMICAL STUDIES ON TUMOR GROWTH. COMPREHENSIVE PROGRESS REPORT, OCTOBER 1, 1967--JULY 14, 1973.
L. A. Dethlefsen. 1973, 13p
Contract AT(11-1)-2269

Descriptors: (*Tumor cells, *Growth), (*Immunosuppression, *Radioinduction), Autoradiography, Biological radiation effects, Carbonic acid derivatives, Cell cycle, Deoxyuridine, Hydroxy compounds, Immune reactions, Iodine 125, Labelled compounds, Mammary glands, Mice, Neoplasms, Organic nitrogen compounds, Quantity ratio, Thymectomy, Tracer techniques, X radiation.

For abstract, see NSA 28 03, number 06002.

COO-2269-2/GA PC$3.00/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Radiology.
KINETIC AND BIOCHEMICAL STUDIES ON TUMOR GROWTH. ANNUAL PROGRESS REPORT, JULY 15, 1972--JULY 14, 1973.
L. A. Dethlefsen. 1973, 5p
Contract AT(11-1)-2269

Descriptors: (*Tumor cells, *Cell proliferation), (*Immunosuppression, *Radioinduction), Biological radiation effects, Cell cycle, Crypt cells, Hydroxy compounds, Mice, Neoplasms, Photon beams, Thymectomy, Thymidine, Tritium, Urea, X radiation.

For abstract, see NSA 28 03, number 06003.

FRNC-CONF-63/GA PC$4.00/MF$1.45
Hopital Cochin, Paris (France).
BIOPHYSICS OF SYNOVIOMATHESIS USING BETA EMITTING ISOTOPES.
J. C. Roucayrol. 1971, 6p CONF-710563-6
In French. U.S. Sales Only.

Descriptors: (*Inflammation, *Radiotherapy), (*Beta sources, *Biological radiation effects), Bone joints, Radiocolloids, Radionuclide administration, Solutions.

For abstract, see NSA 28 03, number 06061.

FRNC-CONF-65/GA PC$4.00/MF$1.45
Institut National de la Sante et de la Recherche Medicale, Paris (France).
INTRA-ARTICULATORY INJECTION OF RADIOACTIVE COLLOIDS. STUDIES WITH ANIMALS.
C. Bonneton. 1971, 6p CONF-710563-1
In French. U.S. Sales Only.

Descriptors: (*Inflammation, *Radiotherapy), (*Radiocolloids, *Biological effects), Bone joints, Injection, Radionuclide administration.

For abstract, see NSA 28 03, number 06062.

NEIC-RR-46/GA PC$10.75/MF$1.45
Instytut Onkologii, Warsaw (Poland).
8TH REPORT ON RESEARCH CONDUCTED IN THE YEAR 1970.
1972, 171p
In several languages. U.S. Sales Only.

Descriptors: (*Carcinogenesis, *Research programs), (*Neoplasms, *Radiotherapy), (*Patients, *Radiation injuries), Carcinomas, Diagnostic techniques, Gamma radiation, Hodgkins disease, Intestines, Lungs, Photon beams, Poland, Radiation sources, Urinary tract, X radiation.

For abstract, see NSA 28 03, number 05967.

N73-27051/4GA PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 115, MAY 1973.
May 73, 99p NASA-SP-7011(115)

Descriptors: *Aerospace medicine, *Bibliographies, Biological effects, Indexes (Documentation), Information systems.

For abstract, see STAR 1118

N73-27057/1GA PC$5.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
INVESTIGATIVE METHODS IN SPACE BIOLOGY AND MEDICINE: TRANSMISSION OF MEDICAL DATA.
R. M. Bayevskiy, and W. R. Adey. Jul 73, 60p
NASA-TT-F-14996
Tran-Transl. Into English from the Publ. "Osnovy Kosmicheskoy Biologii I Meditsiny" Moscow, Nauka, 1973 p 1-86.

Descriptors: *Aerospace medicine, *Telemetry, Cardiography, Exobiology, Physiological tests, U.S.S.R..

For abstract, see STAR 1118

N73-27059/7GA PC$4.25/MF$1.45
Stanford Univ., Calif. Instrumentation Research Lab.
CYTOCHEMICAL STUDIES OF PLANETARY MICROORGANISMS - EXPLORATIONS IN EXOBIOLOGY.
Summary Report, 1 Jan. - 31 Dec. 1972.
J. Lederberg. 31 Dec 72, 44p NASA-CR-133272, IRL-1158
Contracts NGR-05-020-004, ARPA SD-183

Descriptors: *Astronauts, *Bioassay, *Physiological responses, Aerospace medicine, Biochemistry, Gas chromatography, Mass spectroscopy, Physiological tests.

For abstract, see STAR 1118

N73-27069/6GA PC$9.50/MF$1.45
Michigan Univ., Ann Arbor.
THE USE OF A TRACKING TEST BATTERY IN THE QUANTITATIVE EVALUATION OF NEUROLOGICAL FUNCTION.
B. S. Repa. 1973, 147p NASA-CR-132275
Contract NSR-23-005-364

Descriptors: *Clinical medicine, *Compensatory tracking, *Physiological tests, *Psychometrics, Parkinson disease, Psychomotor performance.

For abstract, see STAR 1118

N73-27938/2GA PC$7.75/MF$1.45
Baylor Univ., Houston, Tex. Dept. of Microbiology and immunology.
PRODROMAL DISEASE: IMMUNE RESPONSES OF THE HOST MACROPHAGE SYSTEM TO HUMORAL FACTORS.
Final Report.
B. S. Criswell, and V. Knight. Apr 73, 115p
NASA-CR-133455
Contract NGR-44-003-044

Descriptors: *Immunity, *Infectious diseases, *Macrophages, Antibodies, Influenza, Inoculation, Lymphocytes.

For abstract, see STAR 1119

N73-27951/5GA PC$14.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
CURRENT SCIENTIFIC PAPERS FROM THE AEROSPACE MEDICAL INSTITUTE.
K. E. Klein. 2 Jan 73, 253p DLR-FB-73-15
In German; English Summaries.

Descriptors: *Circadian rhythms, *Flight stress (Biology), *Medical phenomena, *Pilot selection, *Underwater engineering, Acceleration tolerance, Transcontinental systems.

For abstract, see STAR 1119

ORO-4257-1/GA PC$4.00/MF$1.45
North Carolina Univ., Chapel Hill.
CHEST FLUOROSCOPY AND NEOPLASIA IN TUBERCULOSIS PATIENTS: A RETROSPECTIVE SURVEY. PILOT PHASE. FINAL REPORT.
W. B. Wood. 1973, 38p
Contract AT(40-1)-4257

Descriptors: (*Patients, *Biological radiation effects), Biomedical radiography, Chest, Epidemiology, Fluoroscopy, Mortality, Neoplasms, Time dependence, Tuberculosis, X radiation.

For abstract, see NSA 28 02, number 02886.

PATENT-3 697 645/GA Not available NTIS
Office of the Secretary of the Army Washington D C
PURIFICATION OF ANTIBODIES.
Patent,
Eugene P. Meier, David E. Lenz, and Ludwig A. Sternberger. Filed 28 Apr 71, patented 10 Oct 72, 5p Rept nos. PAT-APPL-138 354,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Antigens + antibodies, Purification), (*Patents, Antigens + antibodies), Immunology.
Identifiers: PAT-CL-424-85.

The invention describes methods of obtaining a 100 percent recovery of a specific antibody population from antiserum for the prevention of the adverse effects of various antigens or ligands including poisons in mammals. The antibody population or fraction contains all the properties which can be associated with antibodies to an antigen or ligand, for example, nerve agents.

PATENT-3 745 090/GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
METHOD OF DETECTING AND COUNTING BACTERIA IN BODY FLUIDS.
Patent.
E. W. Chappelle, and G. L. Picciolo. Patented 10 Jul 73, 8p NASA-CASE-GSC-11092-2,
Misc-Field 30 Apr. 1971. Subm-Continuation-in-Part of Abandoned US Patent Appl. Sn-60950, Filed 4 Aug. 1970.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Bacteria, *Bioassay, *Enzyme activity, *Urinalysis, Adenosine diphosphate (Adp), Bioluminescence, Clinical medicine, Patents.

A novel method is reported for determining bacterial levels in urine samples, which method depends on the quantitative determination of bacterial adenosine triphosphate (ATP) in the presence of non-bacterial ATP. After the removal of non-bacterial ATP, the bacterial ATP is released by cell rupture and is measured by an enzymatic bioluminescent assay using an enzyme obtained from the firefly.

PB-223 439/1GA PC$15.25/MF$1.45
West Virginai Div. of Vocational Rehabilitation, Charleston. Program Development Section.
PROCEEDINGS OF A SEMINAR ON SERVING THE SPINAL CORD INJURED CLIENT.
Final rept.,
William R. Phelps. 26 Oct 72, 263p

Descriptors: (*Paralysis, *Rehabilitation), (*Paraplegia, Rehabilitation), (*Spinal cord, Injuries), Occupational therapy, Physical therapy, Vocational guidance, Social psychology, Proceedings.
Identifiers: Quadriplegia.

The material concerns itself with the medical, vocational, social, psychological, recreational and mobility problems of persons with spinal cord injuries (Paraplegia and quadriplegia). The primary purpose focused on more effective counseling and counselor-client relationships. Live clients (consumers) participated in the training effort which was recorded for closed circuit TV and educational TV training purposes. Specific objectives of the training included: Provision of information regarding comprehensive physical care, vocational rehabilitation, and social adjustment of the spinal cord injured person; demonstrations of the amount of physical independence that spinal cord injured persons can regain; evidence that spinal cord injured persons can be rehabilitated; importance of various treatment modalities such as driver education and mobility, job placement approaches, psycho-sexual adjustment, and rehabilitation nursing.

PB-223 569/5GA PC$3.00/MF$1.45
New York Blood Center, N.Y.
NATIONAL COLLABORATIVE TRIAL OF HEPATITIS B IMMUNE GLOBULIN IN PREVENTION OF DIALYSIS ASSOCIATED HEPATITIS.
Annual rept. 30 Jun 72-29 Jun 73,
A. M. Prince. 10 Jul 73, 45p* NIH/NHLI-72-2960-B
Contract PHS-72-2960

Descriptors: (*Hepatitis, Prophylaxis), (*Gamma globulin, Hepatitis), (*Artificial kidneys, Hepatitis), Blood transfusion, Patients, Medical personnel, Infections, Urologic diseases, Therapy.
Identifiers: Hemodialysis.

The purpose of the National Collaborative Trial is to evaluate the possible prophylactic efficacy of two dose levels of hepatitis B immume globulin (HBIG) in prevention and/or modification of hepatitis in patients and staff of renal dialysis units. The study population consists of newly admitted patients and newly or recently hired staff. The study is being conducted in 17 renal dialysis units. The first subject was enrolled in July 1972, and last will be enrolled during this two-year period. Statistical analyses revealed that this sample size will be sufficient to demonstrate a protective effect of HI-HBIG or of HI-HBIG and INT-HBIG within a 95% confidence limit. Study procedures and preliminary results are discussed.

PB-223 578/6GA PC$3.00/MF$1.45
International Center for Medical Research and Training, San Jose (Costa Rica).
STUDIES ON THE EPIDEMIOLOGY OF HEPATITIS ASSOCIATED ANTIGEN AND VIRAL HEPATITIS.
Annual rept. 24 Jun 72-30 Jun 73,
Victor M. Villarejos. Aug 73, 35p
Grant PHS-72-2929-B
Prepared by Louisiana State Univ., Baton Rouge, La. Portions of this document are not fully legible.

Descriptors: (*Hepatitis viruses, Epidemiology), (*Costa Rica, Hepatitis viruses), (*Antigens, Hepatitis viruses), Serology, Blood transfusion, Populations, Disease vectors, Infectious diseases, Viral diseases, Public health, Antigen antibody reactions, Blood donors, Hepatitis.

During the report year 261 clinical cases and their contacts were studied; 89 chronic HBA carriers were detected and their habitual contacts were identified and are being followed. Serologic surveys for HB antigen and antibody were performed in three communities, and in special groups of population at risk, i.e. health workers and food handlers. Blood donors and recipients of transfusion are being investigated also. The results obtained to date show distinct differences in the epidemiological patterns of type A and type B disease in this endemic area, and point to nonparenteral transmission of both types of hepatitis. Portions of this document are not fully legible.

PB-223 612/3GA PC$2.75/MF$1.45
Walter Reed Army Medical Center, Washington, D.C.
EFFICACY OF HYPERIMMUNE HBAB GAMMA GLOBULIN FOR THE PREVENTION OF TRANSFUSIONAL HEPATITIS.
Annual rept. FY 73,
Marcel E. Conrad, Allen L. Ginsberg, and Eugene P. Flannery. 24 Jul 73, 10p

Descriptors: (*Hepatitis, Prophylaxis), (*Gamma globulin, Hepatitis), (*Blood transfusion, Hepatitis), Immunity, Antigens, Hepatitis viruses, Antibodies.
Identifiers: Australia antigen.

A prospective double blinded study was initiated during August 1972 in patients undergoing cardiac surgery to ascertain if gamma globulin which contains a high titer of HBAb will provide protection against transfusional hepatitis. Patients are receiving either a placebo solution or human serum gamma globulin. Two lots of gamma globulin are used; one lot has a high titer of HBAb and the other is a conventional lot with small amounts of HBAb. Volunteers are followed at intervals after surgery to determine if they develop either clinical hepatitis, HBAg, or HBAb.

PB-223 659/4GA PC$4.75/MF$1.45
North Carolina Univ., Chapel Hill. Mecklenburg Criminal Justice Pilot Project.
CAUSES AND EFFECTS OF DRUG ABUSE,
Gloria A. Grizzle. 29 Oct 71, 52p

Descriptors: (*Drug addiction, Reduction), (*Rehabilitation, *North Carolina), Treatment, Information systems, Sources, Community relations, Classifications, Family relations, Pattern recognition, Social psychology, Socioeconomic status, Attitudes, Physical fitness, Factor analysis, Motivation, Project planning.
Identifiers: *Drug abuse, Causes and effects, Ghettos.

A community action committee developed a diagram representing causes and effects of drug abuse to aid in reducing them. The causes and effects were identified by literature search and the ideas of committee members are shown in a flow diagram indicating explicit path relationships. Percent occurrence of the paths is shown where possible and points of intervention are also described. Feasible means of intervention to break the paths are described. Important cause and effect relationships are summarized and source references are given.

PB-223 705/5GA PC$3.75/MF$1.45
Rochester Univ., N.Y. School of Medicine and Dentistry.
ALPHA-1-ANTITRYPSIN DEFICIENCY AND CHRONIC RESPIRATORY DISEASE.
Annual rept. 28 Jun 71-20 Jun 72,
Robert H. Schwartz. 20 Jun 72, 80p NIH/NHLI-77-2221-1
Contract PHS-77-2221-1

Descriptors: (*Respiratory diseases, Trypsin), (*Trypsin, *Antibodies), Epidemiology, Lung, Proteins, Genetics, Immunology.
Identifiers: Alpha 1 antitrypsin, *Antitrypsin, *Chronic lung disease, *Deficiency diseases.

In 1963, Laurell and Eriksson first reported the association of antitrypsin (AAT) and lung disease. Through a method developed by Fagerhol, it has become clear that this protein abnormality is inherited in a multiallelic, autosomal, codominant fashion. A survey of randomly selected adults in Monroe County, N.Y. and adults attending an early disease detection clinic is being made to determine the prevalence of variant protease inhibitor (Pi) types of alpha-1-antitrypsin. For 669 persons studied, the following prevalences have been found: MM(88.34%), MS(5.82%), MZ(4.48%), FM(0.89%), ZZ(0.14%), SS(0.29%). A total of 2000 people will be studied. CLINICAL SPIROMETRY (FEV, FEV1, MMEFR) did not reveal group abnormalities when persons with Pi MZ, MS, or FM were compared with Pi MM. The prevalence of variant Pi types was similar to control groups when 169 cystic fibrosis patients were studied. Those cystic fibrosis patients with variant Pi types did not have more severe disease.

PB-223 773-T/GA PC$3.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
SINGLE AND REPEATED TRANSPLANTATIONS OF HOMOLOGOUS BONE MARROW IN EXPERIMENTAL HYPOPLASIA OF HEMOPOIESIS CAUSED BY MYELOSAN ADMINISTRATION,
I. P. Snyakina. Sep 73, 8p NIH-74-97C
Trans. of Patologicheskaya Fiziologiya i Eksperimentalnaya Terapiya (USSR) v12 p31-35 1968.

Descriptors: (*Bone marrow, *Surgical transplantation), (*Aplastic anemia, Bone marrow), (*Antineoplastic agents, Aplastic anemia), Toxicity, Therapy, Busulphan, Hematopoiesis, Rats, Translations, Laboratory animals, Drugs, Experimental data, Blood diseases, USSR.

The therapeutic effect of bone marrow transplantation in experimental hemopoiesis aplasia in rats were higher following a single dose of myelosan than in rats administered repeated doses of the drug. In aplasia induced by repeated myelosan administration, the optimal time for transplantation was the first day after the last dose; the fifth and sixth day proved to be optimal in aplasia developing after a single administration of myelosan. Repeated bone marrow transplantations increased the therapeutic effect only when carried out on the fifth and tenth day after the administration of a lethal dose.

SAN-779-3/GA PC$3.00/MF$1.45
Scripps Clinic and Research Foundation, la Jolla, Calif. Dept. Of Experimental Pathology.
FACILITATION OF TRANSPLANTATION BY SERUM FACTORS. PROGRESS REPORT, OCTOBER 1, 1972--MARCH 31, 1973.
J. D. Feldman. 1973, 8p
Contract AT(04-3)-779

Descriptors: (*Animal cells, *Immune reactions).

For abstract, see NSA 28 03, number 07775.

UR-3490-207/GA PC$5.25/MF$1.45
Rochester Univ., N. Y. School of Medicine and Dentistry.
TECHNIQUE OF ISOLATED RAT LIVER PERFUSION DEVELOPED AT THE UNIVERSITY OF ROCHESTER, SCHOOL OF MEDICINE AND DENTISTRY.
L. L. Miller. 1972, 65p CONF-710739-1

Descriptors: (*Perfused organs, *Laboratory equipment), (*Rats, Perfused organs), Liver.

For abstract, see NSA 28 03, number 07823.

6F. Environmental Biology

AD-767 072/2GA PC$2.75/MF$1.45
Georgia State Univ Atlanta Dept of Biology

THE MICROBIAL DEGRADATION OF OIL POLLUTANTS: A WORKSHOP.
Final rept. Sep 72-Aug 73,
Donald G. Ahearn. 30 Aug 73, 14p Rept no. A001AD
Contract N00014-73-C-0066

Descriptors: (*Oils, Decomposition), (*Water pollution, Oils), Symposia, Microorganisms, Oceans.
Identifiers: *Oil pollution, *Biodeterioration.

The report briefly discusses a workshop, 'The Microbial Degradation of Oil Pollutants', which was held at Georgia State University between December 4-6, 1972. Over 70 scientists and government officials were in attendance.

AD-767 086/2GA PC$2.75/MF$1.45
Northwestern Univ Evanston Ill Dept of Biological Sciences
CONTROL OF FLIES AND COCKROACHES BY INSECT HORMONES.
Final technical rept. 10 Sep 72-17 Sep 73,
Lawrence I. Gilbert. 19 Sep 73, 25p*
Contract N00014-67-0356-0024

Descriptors: (*Blattidae, Insect control), (*Diptera, Insect control), (*Hormones, Insect control), Blood, Proteins, Skeleton, Tanning, Worms, Pest control, Phenols, Proteins(Conjugated).
Identifiers: *Biological insect control, Manduca sexta, Hemolymph.

The report summarizes the work conducted on insect cuticular tanning and sclerotization. Possible practical applications of these studies are based on the knowledge that the insect's survival during evolution is in great measure due to their hard, cuticular exoskeleton which protects them from predators and environment stresses (e.g. dessication). If the mechanism of cuticle tanning is elucidated, effective insect control could be obtained by devising methods to inhibit or interfere with the tanning process. The current report summarizes our studies on the relationship between a hemolymph phenolic conjugate and cuticular tanning in the tobacco hornworm, Manduca sexta.

AD-767 178/7GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
BAITS AND ATTRACTANTS FOR EAST COAST YELLOWJACKETS, VESPULA SPP.
Interim rept.,
Roger H. Grothaus, H. G. Davis, W. M. Rogoff, J. A. Fluno, and J. M. Hirst. 2 Jan 73, 5p
Availability: Pub. in Environmental Entomology, v2 n4 p717-718 Aug 73.

Descriptors: (*Hymenoptera, *Insect control), Food, Fishes, Beef, Fatty acids, Esters, Propionic acid.
Identifiers: Vespula squamosa, Vespula maculifrons, *Yellow jacket wasps, Attractants, Baits.

From 1963-70, natural and synthetic baits and attractants were tested against east coast yellowjackets. Fish-flavored cat food and cooked beef were more attractive to Vespula squamosa than to V. maculifrons. Heptyl butyrate and 2,4-hexadienyl propionate were slightly attractive to V. squamosa, but not to V. maculifrons. None of the materials or techniques successfully used on the west coast species appeared to be as effective on the east coast species. (Author)

AD-767 562/2GA PC$8.25/MF$1.45
Texas A and M Univ College Station Dept of Biology
ANNOTATED BIBLIOGRAPHY ON EFFECTS OF SALINITY AND SALINITY CHANGES ON LIFE IN COASTAL WATERS.
Final rept.,
Sewell H. Hopkins. Aug 73, 419p* AEWES-CR-H-73-2
Contracts DACW39-72-C-0002, DACW73-69-C-0043
Sponsored in part by contract DACW73-70-C-0004.

Descriptors: (*Ecology, Aquatic animals), (*Marine biology, Salinity), Bibliographies, Estuaries, Aquatic animals, Indexes.

References with annotations are given for about 1400 published and unpublished reports, dated 1972 and earlier, on physiological and ecological effects of salinity, salinity differences, and changes in salinity on organisms living in estuaries and other coastal waters. A subject index with cross-indexing is provided. (Author)

BMI-171-121/GA PC$3.00/MF$1.45
Battelle Memorial Inst., Columbus, Ohio.
PESTICIDE RESIDUES IN BIRDS FROM AMCHITKA ISLAND. AMCHITKA BIOENVIRONMENTAL PROGRAM.
D. E. Bell. 8 May 69, 7p
Contract AT(26-1)-171

Descriptors: (*Birds, *Pesticides), (*Amchitka island area, Pesticides), Metabolism.

For abstract, see NSA 28 02, number 05000.

BMI-171-148/GA PC$3.00/MF$1.45
Utah State Univ., Logan (Usa). Coll. Of Natural Resources.
FRESHWATER VERTEBRATE AND INVERTEBRATE ECOLOGY OF AMCHITKA ISLAND. AMCHITKA BIOENVIRONMENTAL PROGRAM. ANNUAL PROGRESS REPORT, JULY 1, 1971--JUNE 30, 1972.
W. T. Helm, and R. A. Valdez. Apr 73, 17p
Contract AT(26-1)-171

Descriptors: (*Amchitka island area, *Ecology), Aquatic ecosystems, Cannikin event, Fishes, Lakes, Nuclear explosions, Oils, Pollution, Populations, Rivers, Seismic waves, Silt, Underground explosions.

For abstract, see NSA 28 02, number 02607.

BMI-171-150/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Fisheries Research Inst.
AMCHITKA BIOENVIRONMENTAL PROGRAM. RESEARCH PROGRAM ON MARINE ECOLOGY, AMCHITKA ISLAND, ALASKA. ANNUAL PROGRESS REPORT, JULY 1, 1971--JUNE 30, 1972.
R. E. Nakatani, J. S. Isakson, and R. L. Burgner. Apr 73, 73p
Contract AT(26-1)-171

Descriptors: (*Amchitka island area, *Ecology), Algae, Aquatic ecosystems, Cannikin event, Coastal waters, Fishes, Invertebrates, Milrow event.

For abstract, see NSA 28 02, number 02608.

BNL-17775/GA PC$3.50/MF$1.45
Brookhaven National Lab., Upton, N. Y.
ECOLOGICAL EFFECTS OF GROWTH.
G. M. Woodwell. 3 Apr 73, 26p

Descriptors: (*Biosphere, *Management), Economy, Energy sources, Environment, Food, Human populations, Photosynthesis, Plant growth, Population dynamics, Solar radiation, Stored energy.

For abstract, see NSA 28 02, number 05001.

BNWL-1734/GA PC$7.60/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
AQUATIC BIOENVIRONMENTAL STUDIES IN THE COLUMBIA RIVER AT HANFORD, 1945--1971. A BIBLIOGRAPHY WITH ABSTRACTS.
C. D. Becker. Feb 73, 155p
Contract AT(45-1)-1830

Descriptors: (*Columbia river, *Bibliographies), Aquatic ecosystems, Biology, Hydrology, Radioactive waste disposal, Thermal effluents.

For abstract, see NSA 28 02, number 02561.

BNWL-1738/GA PC$4.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
USE OF HANFORD WASTE PONDS BY WATERFOWL AND OTHER BIRDS.
R. E. Fitzner, and K. R. Price. Feb 73, 47p
Contract AT(45-1)-1830

Descriptors: (*Birds, *Populations), (*Hapo, *Radioactive waste disposal), Contamination, Ecosystems, Intake, Liquid wastes, Radioactivity, Radioisotopes, Radionuclide migration, Seasons.

For abstract, see NSA 28 02, number 02609.

COM-73-11495/1GA Reprint
National Marine Fisheries Service, Highlands, N.J. Sandy Hook Lab.
INVERTEBRATE RESOURCES; AVAILABLE FORMS AND POTENTIALS.
John B. Pearce. 1972, 17p NOAA-73073014
Pub. in Resources of the World's Ocean, 1972 p75-90.

Descriptors: (*Invertebrates, Resources), (*Water pollution, Invertebrates), Shellfish, Aquatic animals, Aquaculture, Water quality, Coasts, Food supply.

Following an examination of the multiplicity of invertebrate life and the conditions which make it possible for these organisms to survive, the author concludes that both the harvesting of natural populations of shellfish and other invertebrates and the future of mariculture are both predicted upon quality water. If the marine environment from Boston to Chesapeake Bay is indicative of future developments, we can anticipate that in the future coastal water quality will not be adequate to sustain marine life. Unless we change our present policy, our present ways of doing things, we cannot hope for the sea to sustain a yield comparable even to that which is obtained at the present time.

CONF-720708-13/GA PC$3.25/MF$1.45
National Marine Fisheries Service, Baufort, N.C. (Usa). Atlantic Estuarine Fisheries Center.
FLUX OF MN, FE, AND ZN IN AN ESTUARINE ECOSYSTEM.
D. A. Wolfe, F. A. Cross, and C. D. Jennings. 1972, 21p SM-158/10

Descriptors: (*Iron, *Biogeochemistry), (*Manganese, Biogeochemistry), (*Zinc, Biogeochemistry), (*Aquatic ecosystems, Biogeochemistry), Estuaries, Fishes, Invertebrates, North carolina, Ph value, Plankton, Retention, Salinity, Sampling, Seasonal variations, Seawater, Sediments, Temperature dependence.

For abstract, see NSA 28 02, number 02596.

CONF-730419-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
DATA ACQUISITION SYSTEM FOR ECOLOGICAL FIELD STUDIES.
C. D. Martin, J. T. Hutton, and R. L. Simpson. 1973, 4p

Descriptors: (*Ecology, *Data acquisition systems), Automation, Computers, Flow rate, Measuring methods, Rain, Surface waters.

For abstract, see NSA 28 03, number 07685.

CONF-730503-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ASSESSING POTENTIAL RADIOLOGICAL IMPACTS TO AQUATIC BIOTA IN RESPONSE TO THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) OF 1969.
S. V. Kaye. 1973, 14p

Descriptors: (*Aquatic ecosystems, *Contamination), (*Nuclear power plants, *Radioactive wastes), (*Plants, *Radiation doses), (*Fishes, Radiation doses), Body, Cesium 134, Cesium 137, Cobalt 58, Cobalt 60, Environment, Manganese 54, Radiation hazards, Radioactivity, Radioisotopes, Reactor sites, Retention, Strontium 90, Strontium 91, Water, Water cooled reactors.

For abstract, see NSA 28 03, number 05539.

COO-2111-3/GA PC$3.75/MF$1.45
Utah Univ., Salt Lake City. Dept. Of Biology.
ENVIRONMENTAL FACTORS AND REPRODUCTIVE PROCESSES IN MAMMALIAN POPULATIONS.
N. C. Negus, and P. J. Berger. 1972, 32p CONF-720348-1

Descriptors: (*Mammals, *Population dynamics), Environment, Nutrients, Physiology, Reproduction, Seasonal variations, Wild animals.

For abstract, see NSA 28 03, number 07702.

COO-3222-3/GA PC$3.00/MF$1.45
Columbia Univ., Palisades, N. Y. Lamont-Doherty Geological Observatory.
OPERATIONS ORDER: R/V ATLANTIC TWIN, DECEMBER 12--14, 1972.
1972, 5p
Contract AT(30-1)-3222

Descriptors: (*Plankton, *Metabolism), (*Nitrogen, Metabolism), Aquatic ecosystems, Atlantic ocean.

For abstract, see NSA 28 02, number 05020.

COO-3390-7/GA PC$3.00/MF$1.45
New York Aquarium, Brooklyn. Osborn Labs. Of Marine Sciences.
ROLE OF PLANKTONIC PROTOZOA IN THE MARINE FOOD CHAIN. SEASONAL CHANGES, RELATIVE ABUNDANCE, AND CELL SIZE DISTRIBUTION OF TINTINNIDA. PROGRESS REPORT, MAY 1, 1972--APRIL 30, 1973.
1973, 18p
Contract AT(11-1)-3390

Descriptors: (*Protozoa, *Animal growth), (*Aquatic ecosystems, *Food chains), Distribution, Medium temperature, Plankton, Seasonal variations, Size.

For abstract, see NSA 28 03, number 07711.

EDFB-IBP-73-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ORGANIC MATTER BUDGET AND MODEL FOR A SOUTHERN APPALACHIAN LIRIODENDRON FOREST.
P. Sollins, D. E. Reichle, and J. S. Olson. Apr 73, 150p
Contract W-7405-eng-26

Descriptors: (*Forests, *Nutrients), Biological materials, Computer calculations, Decomposition, Mathematical models, Organic compounds, Tennessee, Terrestrial ecosystems, Time dependence, Trees.

For abstract, see NSA 28 02, number 05022.

NRC-TT-1625/GA PC$3.00/MF$1.45
NUTRITIVE IMPORTANCE AND STRUCTURE OF DETRITUS.
A. G. Rodina. 1972, 11p
Translated by V. Poppe from pp 35-42 of Biologicheskie resursy vodoemov, puti ikh rekonstruktsii i ispol'zovaniya, Izdatel'stvo Nauka, Moscow, 1966. U.S. Sales Only.

Descriptors: (*Aqueous ecosystems, *Nutrients), Biological materials, Depth, Food, Growth, Invertebrates, Microorganisms, Plankton, Population dynamics.

For abstract, see NSA 28 02, number 05050.

ORNL-NSF-EP-37/GA PC$21.75/MF$1.45
Oak Ridge National Lab., Tenn.
REGIONAL MODELING ABSTRACTS: A BIBLIOGRAPHY OF REGIONAL ANALYSIS. VOLUME IV.
C. R. Jr. Meyers. Mar 73, 391p ORNL-EIS-72-53
Contract W-7405-eng-26

Descriptors: (*Ecology, *Bibliographies), (*Environment, Bibliographies), (*Human populations, Bibliographies), (*Tennessee, *Regional analysis), Geography, Indexes, Mathematical models, Simulation, Sociology.

For abstract, see NSA 28 02, number 05052.

ORO-3759-5/GA PC$6.75/MF$1.45
Miami Univ., Fla. Rosenstiel School of Marine and Atmospheric Sciences.
STUDIES WITH TROPICAL AND SUBTROPICAL MICROALGAE. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
J. S. Bunt. 1973, 92p
Contract AT(40-1)-3795

Descriptors: (*Corals, *Communities), Algae, Aquatic ecosystems, Depth, Environment, Food chains, Nutrients, Seas, Seawater.

For abstract, see NSA 28 02, number 05055.

PB-223 559/6GA PC$4.25/MF$1.45
California Univ., Davis. Water Resources Center.
THE COMPUTER-SYSTEMS APPROACH TO ENVIRONMENTAL PROTECTION, PLANNING AND MANAGEMENT: THE MALIBU WATERSHED,
Earl S. Flowers, and Don May. Dec 71, 123p*
UCAL-WRC-W-330, Contrib-136 W73-14371, OWRR-A-038-CAL(2)
Prepared in cooperation with California Univ., Los Angeles. School of Public Health.

Descriptors: (*Water resources, Mathematical models), (*Malibu watershed, *Environmental simulation), Computerized simulation, Summarizing, Systems analysis, Water quality, Hydrology, Ecology, Human behavior, Reviews, Watersheds, California.
Identifiers: *Quality of life.

Computer models are described in hydrology, water quality, ecology, behavioral systems, and data management prepared as a part of a multidisciplinary project studying the environment of the Malibu watershed. Over one hundred models have been selected and described from the literature, and possible applications of the models to the protection, planning and management of the Malibu watershed are discussed in terms of an environmental systems approach. The objective has been to describe computer methods, techniques, software, and possible application of computer systems to general environmental systems with emphasis on the water resource. (Author)

PB-223 566/1GA PC$2.75/MF$1.45
Rhode Island Univ., Kingston. Water Resources Center.
PLANT PHENOLS AND RELATED ORGANIC COMPOUNDS IN PUBLIC WATER SOURCES, THEIR RELATIONSHIP TO CHLORINATION.
Final rept. 1 Jul 71-30 Jun 73,
Yuzuru Shimizu. 1973, 14p W73-14468, OWRR-A-041-RI(1)
Contract DI-14-31-0001-3840

Descriptors: (*Phenols, *Chlorination), (*Cinnamic acid, Chlorination), (*Amino acids, Chlorination), (*Biocides, Chlorine organic compounds), (*Chlorine organic compounds, *Toxicology), Bacteria, Mollusca, Snails, Mice, Nitriles.
Identifiers: *Flavonoids, *Water pollution effects(Animals).

In the investigation of interaction between organic pollutants and active chlorine in water, hydroxycinnamic acids were found to afford various chlorinated styrene and chlorinated quinone derivatives. Phenolic amino acids tyrosine gave chlorinated benzyl acetonitrile derivatives. Furthermore, it was discovered that, in general, free amino acids afford nitrile derivatives even in a very high dilution. To evaluate the possible effects of these products to human and ecological systems, antimicrobial, molluscicidal activities and acute toxicities to mice were investigated. In each case, mild activity was observed with most of the compounds. This means that chlorine used in water and sewage treatment is partly fixed by binding with these organic compounds to form possibly toxic compounds.

PB-223 662/8GA PC$4.50/MF$1.45
Battelle Columbus Labs., Ohio.
A COMPREHENSIVE APPRAISAL OF THE EFFECTS OF COOLING WATER DISCHARGE ON AQUATIC ECOSYSTEMS.
Summary rept.,
Arthur A. Levin, Thomas J. Birch, Robert E. Hillman, and Gilbert E. Raines. Sep 70, 49p
Presented at the Atomic Industrial Forum, Inc. Public Affairs Workshop 'Why Nuclear Power', Hilton Head Island, S. Carolina, 13-16 Sep 70.

Descriptors: (*Cooling water, *Aquatic biology), (*Environmental surveys, Cooling water), (*Water pollution, Cooling water), Fresh water biology, Marine biology, Metabolism, Ecology, Plant growth, Reproduction(Biology), Heat.
Identifiers: *Water pollution effects(Plants), *Water pollution effects(Animals), *Thermal pollution, Fishkill.

Data in the available literature concerning both laboratory and field experimentation and operation for both freshwater and marine applications were appraised and specific evaluations of the effects of cooling water discharge on fishes and other aquatic organisms were performed. Effects on metabolism, feeding and growth, reproduction and development, parasitism and disease, and other behavioral considerations were considered, as well as specific thermal mortality. Effects upon food organisms and the resultant ecosystem considerations were also discussed. (Modified author abstract)

RLO-2225-T-26-8/GA PC$3.75/MF$1.45
Washington Univ., Seattle. Dept. Of Oceanography.
FEEDING PROCESSES AT LOWER TROPHIC LEVELS IN PELAGIC COMMUNITIES.
B. W. Frost. 1972, 33p
Contract AT(45-1)-2225

Descriptors: (*Aquatic ecosystems, *Food chains), Depth, Invertebrates, Nutrients, Oceanography, Plankton, Population dynamics, Seas, Vertebrates.

For abstract, see NSA 28 02, number 05060.

RLO-2227-T-12-27/GA PC$3.25/MF$1.45
Oregon State Univ., Corvallis. Dept. Of Oceanography.
RADIOECOLOGY OF BENTHIC FISHES OFF OREGON, U.S.A.
W. G. Pearcy, and H. A. Vanderploeg. 1972, 24p
SM-158/14

Descriptors: (*Fishes, *Radionuclide kinetics), (*Zinc 65, *Radiation monitoring), (*Cobalt 60, Radiation monitoring), (*Manganese 54, Radiation monitoring), Cerium 144, Cesium 137, Oregon, Pacific ocean, Potassium 40, Radioactive wastes, Radioactivity, Radioecology, Reactors.

For abstract, see NSA 28 03, number 05567.

RLO-2227-T-12-37/GA PC$7.75/MF$1.45
Oregon State Univ., Corvallis.
DYNAMICS OF EXP 65 ZN IN BENTHIC FISHES AND THEIR PREY OFF OREGON.
H. A. Vanderploeg. Jun 73, 114p

Descriptors: (*Zinc 65, *Radioecological concentration), (*Fishes, *Radionuclide kinetics), (*Annelids, Radionuclide kinetics), (*Crustaceans, Radionuclide kinetics), Diffusion, Geography, Molluscs, Oregon, Pacific ocean, Seasonal variations.

For abstract, see NSA 28 03, number 05568.

PT/BIO-(72)77/GA PC$10.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, la Spezia (Italy). Laboratorio Per Lo Studio Della Contaminazione Radioattiva Del Mare.
STUDIES ON THE RADIOACTIVE CONTAMINATION OF THE SEA. ANNUAL REPORT, 1971.
M. Bernhard. 1972, 161p EUR-4865
U.S. Sales Only.

Descriptors: (*Mediterranean sea, *Radiation monitoring), (*Aquatic ecosystems, *Radionuclide migration), (*Fuel reprocessing plants, *Radioactive waste disposal), Coastal waters, Contamination, Diffusion, Environment, Invertebrates, Italy, Liquid wastes, Marine disposal, Oceanography, Pesticides, Plankton, Radioecological concentration, Radioisotopes, Seawater, Seaweeds, Shores, Vertebrates, Waste disposal.

For abstract, see NSA 28 02, number 02597.

SGAE-BL-55/73/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie, G.M.B.H., Seibersdorf. Institut fuer Biologie.
MODIFICATION OF GENETIC MATERIALS OF THE CELL BY CHEMICAL COMPOUNDS WHICH REPRESENT ENVIRONMENTAL CONTAMINATION.
H. Altmann. Jan 73, 23p SGAE-2084
In German. U.S. Sales Only.

Descriptors: (*Pollution, *Genetic effects), Additives, Environment, Food, Mammals, Mutagens, Pesticides.

For abstract, see NSA 28 02, number 05068.

US-IBP-72-3(Vol.2)(No.4)/GA PC$5.75/MF$1.45
Oak Ridge National Lab., Tenn.
ABSTRACTS US-INTERNATIONAL BIOLOGICAL PROGRAM ECOSYSTEM ANALYSIS STUDIES.
N. Ferguson. Dec 72, 73p
Contract W-7405-eng-26

Descriptors: (*Terrestrial ecosystems, *Bibliographies), Animals, Deserts, Forests, Grass, Plants, Shrubs, Usa.

For abstract, see NSA 28 03, number 07826.

US-IBP-73-1(Vol.3)(No.1)/GA PC$5.25/MF$1.45
Oak Ridge National Lab., Tenn.
ABSTRACTS US-INTERNATIONAL BIOLOGICAL PROGRAM ECOSYSTEM ANALYSIS STUDIES.
N. Ferguson. Mar 73, 61p
Contract W-7405-eng-26

Descriptors: (*Terrestrial ecosystems, *Animals), Bibliographies, Deserts, Forests, Grass, Plants, Shrubs, Usa.

For abstract, see NSA 28 03, number 07827.

6G. Escape, Rescue, and Survival

AD-767 471/6GA PC$4.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
ESCAPE MEASURES FOR COMBAT HELICOPTER CREWS.
Advisory rept.
Aug 73, 40p Rept no. AGARD-AR-62
NATO furnished.

Descriptors: (*Escape systems(Aerospace), *Helicopters), Reviews, Aviation accidents, Helicopter rotors, Flight crews, Human engineering.

The report describes different inflight escape concepts for helicopter crews and assesses them against nine major evaluation criteria. Six most promising escape concepts are identified and are evaluated on a comparative basis, with respect to the criteria. Recommendations are made for retrofittable, near-term and far-term solutions for crew escape from helicopters. The report also discusses the unique helicopter escape problems caused by the presence of the rotor and reviews techniques for rotor disposal. Helicopter accident data from four countires are presented in the report to indicate the flight conditions at the time of the emergencies. The report was prepared by a Working Group sponsored by th the Flight Mechanics Panel of AGARD.

COM-73-11458/9GA PC$5.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
EMERGENCY LOCATOR TRANSMITTERS. EFFECTIVE RADIATED POWER LEVELS AND TECHNIQUES OF DETERMINING EFFECTIVE RADIATED POWER,
H. E. Taggart, J. L. Workman, and R. E. Nelson.
16 Feb 71, 59p NBS-9769
Sponsored in part by Department of Transportation, Washington, D.C.

Descriptors: (*Crash locator beacons, Radiofrequency power), Radio transmitters, Rescue beacons, Aircraft equipment, Aviation safety.
Identifiers: Emergency locator transmitters.

The purpose of the report is to clarify the question regarding radiated power and to develop practical techniques of determining the effective radiated power emanating from the Emergency Locator Transmitter (ELT). The ELT is a radio transmitting device that may be either permanently mounted in an airplane, portable, ejectable, or floatable on water for emergency use only.

6H. Food

AD-767 232/2GA PC$2.75/MF$1.45
Army Natick Labs Mass Food Lab
THE EFFECT OF SOYBEAN OIL SHORTENING AND COTTONSEED OIL SHORTENING ON THE SHELF LIFE OF CRACKERS.
Technical rept.,
Nancy J. Kelley, and Patricia Ann Prell. Aug 73, 21p* Rept no. FL-164 USA-NLABS-TR-72-75-FL

Descriptors: (*Food, *Storage), (*Vegetable oils, Storage), Oxidation, Temperature, Chemical analysis, Stability, Military rations, Army research.
Identifiers: Soybean oil, Cottonseed oil, *Crackers.

The effect of hydrogenated soybean oil and cottonseed oil on the rate of development of oxidation of canned ration crackers under prolonged storage at elevated temperatures was investigated. Chemical analyses indicated that the peroxide value and oxygen uptake in the crackers made with soybean oil increased at a higher rate than in those made with cottonseed oil. The profile panel results indicated that crackers prepared with both shortenings were stable for 24 months at 40F or 70F. However, upon storage at 100F or 120F, inappropriate notes (such as oxidized oil) were detected in soybean oil crackers at an earlier stage than in the cottonseed oil crackers. In addition, the intensity of these inappropriate notes increased at a higher rate in the soybean oil crackers as storage time progressed. (Author) Portions of this document are not fully legible.

AD-767 536/6GA PC$4.50/MF$1.45
New York State Agricultural Experiment Station Geneva
EVALUATION OF SULFITE TREATMENT OF RED TART CHERRIES, GREEN BELL PEPPERS, AND APPLES FOR DEHYDRATION.
Final rept. Jun 70-Jun 72,
Robert L. LaBelle, and Terry E. Acree. Sep 73, 147p USA-NLABS-TR-74-14-FL, FL-175
Contract DAAG17-70-C-0181

Descriptors: (*Dehydrated foods, Tests), (*Sulfites, Dehydrated foods), Drying, Performance(Engineering), Tables.
Identifiers: Cherries, Apples, Peppers, Desiccation, *Food processing.

Red tart cherries, diced green bell peppers, and diced apple were dried in various ways with and without sulfite treatment. Drying alternatives included short exposure to circulating hot air (air-drying), intermediate exposure at reduced temperature and pressure (vacuum-drying) and long exposure to high vacuum in the frozen state (freeze-drying). Sulfite treatment of these materials was accomplished by dipping in an aqueous solution of NaHSO3 (1000-10,000 ppm) or by tumbling in a mixture of SO2 in air. The dried products were hermetically packaged, in some cases under nitrogen or with desiccant, and stored for six months at -35 or +100F. Product quality was then evaluated in terms of moisture, residual SO2, color, odor or flavor, and rehydration characteristics. (Modified author abstract)

BFL-4/1972/GA PC$4.00/MF$1.45
Bundesforschungsanstalt fuer Lebensmittelfrischhaltung, Karlsruhe (West Germany).
INVESTIGATION OF INDUSTRIAL PROCESSING AND STORAGE OF IRRADIATED POTATOES AND ONIONS.
H. Penner, Th. Gruenewald, G. Rumpf, and M. Gehse. Sep 72, 38p
In German. U.S. Sales Only.

Descriptors: (*Potatoes, *Radiopreservation), (*Onions, Radiopreservation), Additives, Genetic variability, Heat treatments, Irradiation, Sprout inhibition, Storage life.

For abstract, see NSA 28 02, number 02801.

COM-73-11524/8GA PC$2.75/MF$1.45
Texas Agricultural Extension Service, College Station.
SEAFOOD QUALITY CONTROL: A MANUAL FOR PROCESSING PLANT PERSONNEL,
Ranzell Nickelson, II. Jun 73, 8p TAMU-SG-73-504 NOAA-73082806

Descriptors: (*Seafood, Quality control), (*Food sanitation, Manuals), Food contamination, Bacteria, Food processing, Food preparation, Refrigeration, Staphylococcus.
Identifiers: Sea Grant program.

The bulletin is designed to answer questions that a seafood processing plant employee might ask about certain practices he is required to follow. After explaining what bacteria are, explanations are given on why it is important to keep bacteria from seafoods, why hairnets must be worn, why food handlers must have health certificates. It is indicated that gloves should be worn if employees wear jewelry. The importance of quality control is emphasized.

LA-5246-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DETERMINATION OF TRICHINELLAE IN PORK.
P. M. Giles. Apr 73, 7p
Contract W-7405-eng-36

Descriptors: (*Meat, *Trichinella), Microscopy, Sample preparation.

For abstract, see NSA 28 03, number 07731.

N73-27944/0GA PC$16.00/MF$1.45
Minnesota Univ., St. Paul. Dept. of Food Science and Nutrition.
STORAGE STABILITY AND IMPROVEMENT OF INTERMEDIATE MOISTURE FOODS.
Final Report, 27 Mar. 1972 - 27 Mar. 1973.
T. P. Labuza. 17 Mar 73, 277p NASA-CR-133978
Contract NAS9-12560

Descriptors: *Food, *Space shuttles, *Storage stability, Chelates, Moisture content, Oxidation, Space flight feeding.

For abstract, see STAR 1119

PATENT-3 705 814/GA Not available NTIS
Office of the Secretary of the Army Washington D C
DIRECTLY EDIBLE, COMPACTED AND DEHYDRATED FRUIT BAR.
Patent,
Abdul R. Rahman, and Glenn R. Schafer. Filed 20 Aug 70, patented 12 Dec 72, 3p Rept nos. PAT-APPL-65 700,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Dehydrated foods, Fruits), (*Patents, Dehydrated foods), Compressive properties, Moisture, Phospholipids.
Identifiers: PAT-CL-99-204.

The invention relates to a method of making compacted, dehydrated fruit bars which may be eaten directly without prior rehydration.

PB-223 614/9GA PC$3.00/MF$1.45
Informatics, Inc., Rockville, Md.
GRAS (GENERALLY RECOGNIZED AS SAFE) FOOD INGREDIENTS - GUM ARABIC.
Final rept. 1920-1972.
Jun 72, 50p* TR-72-1552-01 FDABF-GRAS-001
Contract FDA-72-104
Supersedes PB-221 201.

Descriptors: (*Acacia, *Food additives), Gums, Toxicology, Biochemistry, Chemical properties, Immunology, Bibliographies, Public health, Standards.
Identifiers: *GRAS food ingredients, *Gum arabic, Generally recognized as safe food ingredients.

The report summarizes all available scientific data related to the safety of gum arabic as a food ingredient. The period of the literature search covered is 1920 to 1972, and the monograph summarizes the chemical information, biological data, and biochemical aspects of gum arabic specifically. Three hundred seventy-two references are given in the bibliography.

6I. Hygiene and Sanitation

SU-326-P-34-2/GA PC$6.75/MF$1.45
Stanford Univ., Calif. (Usa). Medical Center.
IONIZING RADIATION AS A HOSPITAL STERILIZING AND DISINFECTING AGENT. FINAL REPORT.
T. A. Gonda, T. J. Harder, E. C. Strom, M. E. Donnelly, and T. M. Jr. Carpenter. 28 Feb 73, 95p
Contract AT(04-3)-326

Descriptors: (*Microorganisms, *Radiosterilization), Hospitals, Ionizing radiations, Irradiation, Laboratory equipment, Medical supplies, Sterilization, Surfaces, Surgical materials.

For abstract, see NSA 28 03, number 05915.

6K. Life Support

N73-27067/0GA PC$7.75/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
BIOLOGICAL LIFE SUPPORT SYSTEMS.
Y. Y. Shepelev. Jul 73, 113p NASA-TT-F-15005
Contract NASW-2483
Tran-Transl. Into English from Osnovy Kosmich. Biol. I Med. (Moscow), V. 3, Pt. 3, CH. 3, 1973 p 1-115.

Descriptors: *Bioengineering, *Life support systems, Bionics, Human factors engineering, Photosynthesis, Space flight feeding.

For abstract, see STAR 1118

N73-27068/8GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
SAFETY OF LIFE AND HEALTH OF CREWS OF SPACECRAFT AND SPACE STATIONS IN EMERGENCY SITUATIONS.
I. N. Chernyakov. Jul 73, 38p NASA-TT-F-14997
Tran-Transl. Into English from the Publ. "Osnovy Kosmicheskoy Biologii I Meditsiny" Moscow, Acad. Of Sci., 1973 p 1-64.

Descriptors: *Emergency life sustaining systems, *Manned space flight, Breathing apparatus, Fires, Pressure reduction.

For abstract, see STAR 1118

N73-27071/2GA PC$10.50/MF$1.45
AiResearch Mfg. Co., Torrance, Calif.
STUDY AND DEVELOPMENT OF A CRYOGENIC HEAT EXCHANGER FOR LIFE SUPPORT SYSTEMS.
Final Report.
M. M. Soliman. 23 Mar 73, 167p NASA-CR-124301, REPT-73-9117
Contract NAS8-28099

Descriptors: *Cryogenics, *Heat exchangers, *Life support systems, *Spacecraft environments, Cost effectiveness, Environmental control, Freon, Heat sinks.

For abstract, see STAR 1118

N73-27072/0GA PC$5.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Biotechnology and Power Dept.
COST ANALYSIS OF LIFE SUPPORT SYSTEMS.
Final Report.
M. M. Yakut. Jun 73, 58p NASA-CR-124305, MDC-G4630
Contract NAS8-28377

Descriptors: *Cost estimates, *Earth orbits, *Life support systems, *Manned spacecraft, Cost effectiveness, Equipment specifications, Space programs.

For abstract, see STAR 1118

N73-27073/8GA PC$4.75/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Biotechnology and Power Dept.
COST ANALYSIS OF CARBON DIOXIDE CONCENTRATORS.
Final Report.
M. M. Yakut. Jun 73, 54p NASA-CR-124302, MDC-G4631
Contract NAS8-28377

Descriptors: *Carbon dioxide removal, *Concentrators, *Cost estimates, Absorbents, Air filters, Life support systems, Manned spacecraft.

For abstract, see STAR 1118

N73-27074/6GA PC$6.50/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Biotechnology and Power Dept.
COST ANALYSIS OF WATER RECOVERY SYSTEMS.
M. M. Yakut. Jun 73, 87p NASA-CR-124303, MDC-G4632
Contract NAS8-28377

Descriptors: *Cost estimates, *Water reclamation, Cost effectiveness, Performance, Resource allocation, Tests.

For abstract, see STAR 1118

N73-27075/3GA PC$5.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Biotechnology and Power Dept.
COST ANALYSIS OF OXYGEN RECOVERY SYSTEMS.
M. M. Yakut. Jun 73, 57p NASA-CR-124304, MDC-G4633
Contract NAS8-28377

Descriptors: *Cost analysis, *Life support systems, *Oxygen supply equipment, Carbon dioxide, Cost estimates, Electrolysis, Systems engineering.

For abstract, see STAR 1118

N73-27076/1GA PC$4.25/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Biotechnology and Power Dept.
COST ANALYSIS OF ATMOSPHERE MONITORING SYSTEMS.
Final Report.
M. M. Yakut. Jun 73, 45p NASA-CR-124306, MDC-G4634
Contract NAS8-28377

Descriptors: *Cost analysis, *Gas chromatography, *Life support systems, *Mass spectrometers, Controlled atmospheres, Cost estimates, Prototypes.

For abstract, see STAR 1118

N73-27077/9GA PC$3.25/MF$1.45
Society of Automotive Engineers, Inc., New York. Bioenvironmental Systems Study Group.
REVIEW AND EVALUATION OF UNIVERSITY GRANT APPLICATIONS FOR LIFE SUPPORT AND CREW EQUIPMENT RESEARCH IN FISCAL YEAR 1974.
May 73, 24p NASA-CR-133421
Contract NASW-2430

Descriptors: *Life support systems, *Onboard equipment, *Spacecrews, Biological effects, Environmental control.

For abstract, see STAR 1118

N73-27087/8GA PC$8.00/MF$1.45
Hamilton Standard, Windsor Locks, Conn.
SOLID AMINE DEVELOPMENT PROGRAM.
J. S. Lovell. Apr 73, 117p NASA-CR-133963, SVHSER-6185
Contract NAS9-12957

Descriptors: *Absorbers (Materials), *Air filters, *Outgassing, *Polyethylenes, Ammonia, Carbon dioxide removal, Controlled atmospheres, Space shuttles.

For abstract, see STAR 1118

N73-27945/7GA PC$9.50/MF$1.45
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
WASTE COLLECTION SUBSYSTEM DEVELOPMENT.
Technical Report, 1 Jul. 1971 - 31 Dec. 1972.
J. E. Swider, Jr.. Feb 73, 146p NASA-CR-133977, SVHSER-6182
Contract NAS9-12150

Descriptors: *Human wastes, *Spacecrews, *Waste disposal, Equipment specifications, Performance tests.

For abstract, see STAR 1119

N73-27948/1GA PC$3.00/MF$1.45
AiResearch Mfg. Co., Los Angeles, Calif.
DEVELOPMENT OF DESIGN INFORMATION FOR MOLECULAR-SIEVE TYPE REGENERATIVE CO2-REMOVAL SYSTEMS.
R. M. Wright, J. M. Ruder, V. B. Dunn, and K. C. Hwang. Jul 73, 254p NASA-CR-2277, REPT-72-5417
Contract NAS1-8559

Descriptors: *Absorbents, *Carbon dioxide, *Manned space flight, Life support systems, Performance prediction, Systems engineering.

For abstract, see STAR 1119

6L. Medical and Hospital Equipment

AD-767 305/6GA PC$3.00/MF$1.45
Lankenau Hospital Philadelphia Pa
EXPERIMENTAL EVALUATION OF WOVEN POLYLACTIC ACID, POLYESTER TUBES AS TRACHEAL PROTHESES.
Annual summary rept. no. 2, 1 Aug 72-1 Aug 73,
Paul A. Thomas. 10 Aug 73, 9p
Contract DADA17-72-C-2009

Descriptors: (*Prosthetics, *Trachea), (*Polyester plastics, Prosthetics), Laboratory animals, Rabbits, Respiratory system, Surgery, Histology, Experimental data.
Identifiers: *Poly(lactic acid), Biomaterials, *Biocompatible materials.

The experimental thesis that a mechanically suitable tube for tracheal replacement could be fashioned using a mixture of a permanent, nonreactive fiber and a biodegradable fiber was examined by subcutaneous implantation of tubes prepared for use as tracheal prostheses. Histologic comparison of tissue response and rate of degradation of PLA vs. polyester was made. In these experiments it was evident that PLA fibers increase in size two or three-fold prior to eventual dissolution after approximately six months. In addition, increased tissue reactivity is apparent with greater fibroplasia in PLA specimens as compared with woven polyester. These findings indicate that a probability of lumen obstruction exists if PLA is used in prosthetic tubes used in biological systems. (Modified author abstract)

BNWL-1726/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
FEASIBILITY OF A LARGE GAMMA IRRADIATOR AS A HOSPITAL STERILIZATION FACILITY.
R. W. McKee, P. C. Owzarski, C. D. Butcherite, and J. W. Frymier. 17 Jan 73, 182p
Contract AT(45-1)-1830

Descriptors: (*Medical supplies, *Radiosterilization), (*Irradiation plants, *Design), (*Surgical materials, *Sterilization), Bibliographies, Economics, Gamma radiation.

For abstract, see NSA 28 02, number 02802.

COM-73-50792/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Technical Analysis Div.
COST ANALYSIS OF BLOOD BANKING ALTERNATIVES.
Technical note Mar-Aug 72 (Final),
Tex Miller, Marge King, John Flannagan, Ernst Nilsson, and Bob Lemieux. Sep 73, 122p NBS-TN-777
Paper copy available from GPO $1.35 as C13.46:777.

Descriptors: (*Blood banks, *Cost analysis), Benefit cost analysis, Systems engineering, Blood, Collecting methods, Utilization, Storage, Processing, Quality control, Blood transfusion.
Identifiers: Blood donors.

The report provides a description of the current blood banking system and of the collection and derivation of quantitative information concerning system operation and blood cost. A reasonably accurate but somewhat incomplete profile of practices, attitudes, and likely costs of present and alternative systems has been developed. Among the topics presented are a discussion of the blood collection process including statistics on present use and future needs; information relating to donor motivation, attitudes and incentives; a brief summary of demonstration programs in the U.S. and national blood programs in other countries which provides some insight concerning means for improving blood quality and availability; a description of blood processing, storage and distribution procedures; narrative and statistical information relating to blood utilization practices; discussions of post transfusion reactions and frozen blood programs; a discussion of current governmental and professional standards, regulations and controls which influence many, but not all, concerns involved in blood collection and processing.

PATENT-3 699 360/GA Not available NTIS
Office of the Secretary of the Army Washington D C
ONE-SHOT MONOSTABLE MULTIVIBRATOR.
Patent,
Charles W. Ragsdale. Filed 15 Aug 69, patented 17 Oct 72, 5p Rept nos. PAT-APPL-850 403,
Previously filed as PAT-APPL-789 694, 8 Jan 69, Patent License no. 3 587 694.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Vibrators(Mechanical), *Patents), (*Electrocardiography, Vibrators(Mechanical)), Monitors, Heart, Physiology.
Identifiers: PAT-CL-307-273.

Disclosed is the patent of a one-shot multivibrator of simplified and inexpensive construction which produces a constant width output pulse and which once triggered is not affected by additional trigger pulses until after the timing cycle is completed. A charged capacitor and resistor maintain a pair of transistors conducting and the transistors change state when current flow is diverted from them through a third transistor in response to a triggering signal. The multivibrator output is connected by a negative feedback lead to the third transistor. Also disclosed is a rate monitoring portion of an electrical heart monitor incorporating the multivibrator.

PATENT-3 724 933/GA Not available NTIS
Department of the Navy Washington D C
LASER SPECKLE VISUAL TESTER.
Patent,
Windell N. Mohon, and Alfred N. Rodemann.
Filed 8 Sep 71, patented 3 Apr 73, 4p Rept nos. PAT-APPL-178 584,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Visual acuity, Test equipment), (*Patents, Ophthalmology), (*Lasers, Test equipment).
Identifiers: Laser beams, PAT-CL-351-36.

A laser apparatus is invented for projecting a laser speckle pattern on a suitable surface. A subject whose visual acuity is being tested observes the speckle pattern on the surface with one eye at a time. The subject moves his head or the surface is moved in a designated direction. If hyperopia or myopia is present, the subject can observe apparent movement of the speckle pattern. The speed of the pattern movement apparent to the subject can be measured to determine the degree of any myopic or hyperopic condition present and the optical correction required for each eye.

PATENT-3 736 938/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OPHTHALMIC METHOD AND APPARATUS.
Patent.
J. C. Evvard, W. J. Mcgannon, and D. J. Vargo.
Patented 5 Jun 73, 4p NASA-CASE-LEW-11669-1,
Misc-Filed 15 Nov. 1971 Supersedes N73-23079 (11 - 14, p 1613).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Eye (Anatomy), *Ophthalmology, *Surgical instruments, Cataracts, Medical equipment, Patents, Ultrasonic agitation.

A method and apparatus for removing material and components such as the lens from an eye is described. High speed rotary cutting members at one end of a rod macerate the lens while an annular tubing disposed around the cutting members vibrates ultrasonically to coact with the cutting members in macerating the lens. At the same time, a liquid is supplied to the chamber behind the cornea of the eye. Spiral grooves extending along the rotating rod from the cutting members evacuate the liquid and the macerated material from the eye. An alternate embodiment of the apparatus includes a tube through which liquid is supplied to the operative site of the ultrasonically vibrating tube and the cutting members in the area of the lens.

PB-223 660/2GA PC-GPO/MF$1.45-NTIS
Bureau of Radiological Health, Rockville, Md.
SURVEY OF USE AND PERFORMANCE OF ULTRASONIC THERAPY EQUIPMENT IN PINELLAS COUNTY, FLORIDA,
Harold F. Stewart, Gerald R. Harris, Bruce A.Herman, Ronald A. Robinson, and Michael E. Haran. May 73, 59p DHEW/FDA-73-8039
Prepared in cooperation with Pinellas County Health Dept., Fla.
Paper copy available from GPO $0.90 as stock no. 1715-00056.

Descriptors: (*Ultrasonic radiation, *Medical equipment), Radiotherapy, Performance, Power measurement, Surveys, Florida.

In December, 1972, the Bureau of Radiological Health of the Food and Drug Administration and the Pinellas County, Florida, Health Department conducted a joint survey of ultrasonic theraphy equipment in the St. Petersburg area. Selected facilities were visited, and information was obtained about both the use and performance of this equipment. The operational parameters measured included frequency and modulation characteristics, ultrasonic power output, and timer accuracy. This report presents the results of the survey.

SAN-858-22/GA PC$10.50/MF$1.45
Trw Systems, Redondo Beach, Calif.
PARAMETRIC ANALYSES FOR A RADIOISOTOPE HEAT SOURCE FOR AN ARTIFICIAL HEART DEVICE.
T. H. Smith, and H. Lurie. 31 Jan 72, 166p
Contract AT(04-3)-858

Descriptors: (*Mechanical heart, Radioisotope heat sources), (*Radioisotope heat sources, *Design), Configuration, Heat resisting alloys, Physical properties, Testing.

For abstract, see NSA 28 03, number 05865.

SAN-858-5/GA PC$6.25/MF$1.45
Trw Systems, Redondo Beach, Calif.
MATERIALS SURVEY FOR A RADIOISOTOPE HEAT SOURCE FOR AN ARTIFICIAL HEART DEVICE.
S. E. Bramer. 19 Jun 71, 82p
Contract AT(04-3)-858

Descriptors: (*Mechanical heart, Radioisotope heat sources), (*Radioisotope heat sources, *Fabrication), Fuels, Heat resisting alloys, Oxidation, Physical properties, Reviews, Stability.

For abstract, see NSA 28 03, number 05864.

TID-3335/GA PC$4.00/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
CARDIAC PACEMAKERS AND MECHANICAL HEARTS. A BIBLIOGRAPHY OF RADIOISOTOPE POWER SOURCES.
Apr 73, 45p

Descriptors: (*Cardiac pacemakers, *Bibliographies), (*Mechanical heart, Bibliographies), Radioisotope batteries, Thermoelectric generators.

For abstract, see NSA 28 02, number 02492.

6M. Microbiology:

AD-767 041/7GA PC$7.25/MF$1.45
South Dakota State Univ Brookings Dept of Microbiology
UNIVERSAL VIRUS ADSOPRTION ON INERT PARTICLES UTILIZING THE COATED LATEX ADSORPTION METHOD (CLAM).
Annual rept. 31 Jul 72-30 Jun 73,
Gokaldas C. Parikh, Charles S. Duvall, and Thomas C. Sorensen. Aug 73, 337p
Contract N00014-73-C-0084

Descriptors: (*Viruses, Detection), Antigens + antibodies, Enzymes, Labeled substances, Adsorption, Automation, Quantitative analysis, Instrumentation.
Identifiers: Radioimmunoassay, Coulter counters, Fluorochromes, Latex.

A rapid, easy, universal process (CLAM) was devised for detecting and identifying human pathogenic virues and specific antibodies. Quantititive adsorption and detection of virus by radioimmuno-assay (RIA), Coulter counter system, and fluorochrome tagged enzyme was achieved using latex particles and CLAM process. Modular instrumented packages were assembled and tested. A mini-computer and computer programs specifically designed for rapid quantitation of viral particles and their antibody molecules were used to compute the results within seconds. Data and conclusions for theoretical, experimental, and instrumental proof of the application of CLAM process for virus detection are presented in detail in the report. This research showed that it is possible to develop automated instruments to detect and count viruses within minutes. (Author)

AD-767 435/1GA Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
RAPID SOLID-PHASE RADIOIMMUNOASSAY FOR STAPHYLOCOCCAL ENTEROTOXIN A,
William S. Collins, Anna D. Johnson, Joseph F. Metzger, and Reginald W. Bennett. 15 Jan 73, 4p
Availability: Pub. in Applied Microbiology, v25 n5 p774-777 May 73.

Descriptors: (*Staphylococcus, Detection), (*Food, Staphylococcus), (*Toxins + antitoxins, Staphylococcus), Antigen-antibody reactions, Cellulose, Bacteria, Bromine compounds, Preparation, Biological contamination.
Identifiers: *Radioimmunoassay, Staphylococcal enterotoxin A, *Food contamination.

A rapid solid-phase radioimmunoassay for staphylococcal enterotoxin A is described. The assay procedure requires 3 to 4 hours for completion by using a competitive inhibition system in which the antibody is attached to bromacetyl cellulose particles. It is accurate to a level of 0.01 micrograms of enterotoxin A/ml in a variety of media such as ham, milk products, crab meat, custard, etc. No significant interference was found with any media or food product tested. (Author)

AD-767 542/4GA PC$2.75/MF$1.45
Army Medical Research Lab Fort Knox Ky
THE VACUOLE AS A SUGAR COMPARTMENT IN 'SACCHAROMYCES CEREVISIAE'.
Final rept.,
Edward Spoerl. 25 May 73, 15p Rept no. USAMRL-1038

Descriptors: (*Yeasts, Absorption(Biological)), Ascomycetes, Glucose, Physiology.
Identifiers: Saccharomyces cerevisiae, *Cell vacuoles, *Sugars, Sorbose.

Sorbose influx into yeast previously incubated in 100 mM glucose solutions resulted in more complete equilibration with external sorbose than occurred in yeast incubated in water. Efflux from the glucose-incubated organisms occurred primarily at an initial rapid rate rather than at two different rates, as occurred from H2O-incubated yeast and as occurs from fresh yeast. These differences were apparent after 6 hr of incubation and indicated the lack of a normally occurring intracelluar sorbose compartment in the glucose-incubated organisms. Concurrent with the changes in uptake and efflux, the cell vacuole disappeared, evidence that it is the sorbose compartment. A rapid loss of 260 micrometers absorbing materials indicated that glucose incubation caused an immediate loss of vacuolar contents, apparently resulting ultimately in elimination of the vacuole and an increase in the dry weight per volume of the organisms. Many lipid bodies formed in glucose-incubated yeast, evidently because of the available glucose. (Author)

CONF-730206-3/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
NEW SMALL PROTEINS ASSOCIATED WITH DNA-DEPENDENT RNA POLYMERASE OF E. COLI AFTER INFECTION WITH T4 PHAGE.
A. Stevens, and R. D. Crowder. 1972, 31p

Descriptors: (*Proteins, *Tracer techniques), Bacteriophages, Escherichia coli, Infectivity, Polymerases.

For abstract, see NSA 28 03, number 07680.

CONF-730206-4/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
TRANSCRIPTIONAL CONTROL OF M13 PHAGE DNA REPLICATION.
S. Mitra. 1972, 20p

Descriptors: (*Dna replication, *Bacteriophages), Antibiotics, Dna, Escherichia coli, Inhibition, Polymerases, Rna.

For abstract, see NSA 28 03, number 07681.

COO-1633-24/GA PC$3.50/MF$1.45
Wisconsin Univ., Madison. Biophysics Lab.
STRUCTURE AND SYNTHESIS OF SMALL VIRUSES AND THEIR COMPONENT PARTS. PROGRESS REPORT, FEBRUARY 16, 1972--FEBRUARY 16, 1973.
P. Kaesberg. 27p
Contract AT(11-1)-1633

Descriptors: (*Viruses, *Biosynthesis).

For abstract, see NSA 28 03, number 07697.

COO-3516-2/GA PC$3.00/MF$1.45
Rutgers--The State Univ., New Brunswick, N. J.
MITOCHONDRIAL PHENOTYPES AND GENOTYPES IN YEAST. TECHNICAL ANNUAL PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
C. J. Avers. 1973, 4p
Contract AT(11-1)-3516

Descriptors: (*Yeasts, *Genetics), Biosynthesis, Genotype, Mitochondria, Phenotype, Proteins.

For abstract, see NSA 28 03, number 07712.

ORO-3857-6/GA PC$3.00/MF$1.45
Duke Univ., Durham, N. C. Dept. Of Microbiology and Immunology.
MOLECULAR BIOLOGY OF REOVIRUS MULTIPLICATION. PROGRESS REPORT, JULY 1, 1972--MARCH 31, 1973.
W. K. Joklik. 1973, 8p
Contract AT(40-1)-3857

Descriptors: (*Interferon, *Induction), (*Viruses, *Biological radiation effects), Biosynthesis, Chymotrypsin, Dna, Electrophoresis, Molecules, Mutants, Polypeptides, Proteins, Rna, Ultraviolet radiation.

For abstract, see NSA 28 02, number 02843.

ORO-3941-16/GA PC$3.00/MF$1.45
Duke Univ., Durham, N.C. Dept. Of Biochemistry.
RECOMBINATION IN PNEUMOCOCCUS: REACTANTS AND PRODUCTS.
D. A. Morrison, and W. R. Guild. 1973, 8p

Descriptors: (*Pneumococcus, *Gene recombination), Chromosomes, Crossing-over, Dna, Molecular weight.

For abstract, see NSA 28 03, number 07760.

PATENT-3 687 816/GA Not available NTIS
Department of the Air Force Washington D C
BACTERIAL GROWTH MEDIA.
Patent,
Robert V. Marraro. Filed 17 Jun 70, patented 29 Aug 72, 3p Rept nos. PAT-APPL-47 120,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, *Culture media), (*Bacteria, Growth), Cell wall, Microorganisms.
Identifiers: PAT-CL-195-100, Cultures(Biology), Cell morphology.

A patent is described of a culture media formulated to permit the growth, propagation and maintenance of 'cell wall defective' forms of microorganisms and the induction of 'cell wall defective' forms of microorganisms from their normal parent forms. 'Cell wall defective' forms of microorganisms can be defined as organisms that do not have normal physiologic, morphologic and biochemical cell wall constituents.

PATENT-3 696 561/GA Not available NTIS
Office of the Secretary of the Army Washington D C
BIOLOGICAL DOOR SEAL.
Patent,
Richard D. Harp, and Lyle G. Williams. Filed 1 Apr 71, patented 10 Oct 72, 5p Rept nos. PAT-APPL-130 116,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Seals, *Doors), (*Patents, Seals), (*Biological warfare agents, Containment), Microorganisms, Biological contamination.
Identifiers: PAT-CL-49-483.

The invention relates to door seals and more particularly concerns a reliable biological door seal for use with highly infectious materials and the like. In the area of biological warfare development, continuing experimentation involving highly infectious materials is vital. Any malfunctioning, however slight, of cabinets containing these materials could have devastating ramifications.

PB-223 575/2GA PC$2.75/MF$1.45
Washington Univ., St. Louis, Mo. Div. of Gastroenterology.
DETECTION OF HEPATITIS IN BLOOD.
Annual progress rept. Jul 72-Jul 73,
Richard D. Aach. 1973, 15p NIH/NHLI-71-2353
Contract PHS-71-2353

Descriptors: (*Hepatitis viruses, Assaying), (*Blood, Hepatitis viruses), (*Antigens, Hepatitis viruses), Blood transfusion, Hemagglutination, Serology, Antigen antibody reactions, Tests, Infections, Electrophoresis, Laboratory equipment.
Identifiers: *Radioimmunoassay, Automatic test equipment.

The basic goal is the development, application, and evaluation of extremely sensitive test systems e.g. radioimmunoassay (RIA), in the screening of blood for hepatitis B antigen (HB Ag) and antibodies to HB Ag (anti-HB Ag or HB Ab). To accomplish this goal, investigations have continued to follow the basic objectives: Comparison of HB Ag and anti-HB Ag detection systems; modification of current RIA systems to enhance HB Ag recognition.

UR-3490-100/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics. Carlsberg Foundation, Copenhagen (Denmark). Biological Inst.
ELEMENTAL ANALYSIS OF REFRACTILE BODIES IN AMOEBA PROTEUS.
J. R. Coleman, R. R. Warner, and J. R. Nilsson. 1971, 5p CONF-720714-5

Descriptors: (*Amoeba, *Multi-element analysis), Calcium, Carbon, Chlorine, Cytoplasm, Electron probes, Magnesium, Minerals, Phosphorus, Potassium, Quantitative chemical analysis, Sodium.

For abstract, see NSA 28 03, number 07822.

6N. Personnel Selection and Maintenance (Medical)

AD-767 586/1GA PC$3.00/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
MATERIALS AND PROCEDURES FOR IN-FLIGHT ASSESSMENT OF AUDITORY FUNCTION IN AIRCREWMEN.
Progress rept. Nov 71-Jun 72,
Donald C. Gasaway, and Harrell C. Sutherland, Jr. Aug 73, 42p Rept no. SAM-TR-73-29

Descriptors: (*Audiometry, *Flight crews), Pilots, Speech, Auditory acuity, Hearing, Otorhinolaryngology.

The need to assess the ability of aircrewmen to perceive and understand voiced communications transmitted under headsets during flight conditions has been recognized since the early 1940s. A standardized approach is needed to evaluate the adequacy of auditory function in flyers who fail to pass pure-tone physical profile standards (Class II and III examinations). It is this need that prompted the research described in this report. The report describes four sets of 50 phrases extracted from voice communications used in ground and airborne operations, as well as six lists of 50 single-syllable words. These lists have not been evaluated under the conditions proposed for their use. (Author)

AD-767 646/3GA PC$2.75/MF$1.45
Naval Aerospace Medical Research Lab Pensacola Fla
THE VALUE OF EXERCISE AT ONE-HALF EARTH GRAVITY IN PREVENTING ADAPTATION TO SIMULATED WEIGHTLESSNESS,
John Hoche, and Ashton Graybiel. 25 Jun 73, 22p Rept no. NAMRL-1191
Contract NASA Order T-5904B

Descriptors: (*Space environmental conditions, *Exercise), (*Weightlessness, *Physical fitness), (*Adaptation(Physiology), Countermeasures), Simulation, Deterrence, Centrifuges, Gravity, Males, Students.
Identifiers: Treadmills, Water immersion, Bed rest, Half gravity conditions, Exercise capacity loss.

Twelve male subjects participated in two identical series to determine the value of exercising four hours daily at one-half Earth gravity (simulated) to prevent loss of exercise capacity and orthostatic tolerance when exposed to 14 days of simulated weightlessness. In one series four subjects exercised at half-gravity (HGE subjects) on treadmills mounted in a human centrifuge and four exercised on treadmills mounted on inclined planes; in the other series the subjects switched exercise devices. Four subjects served as no-exercise controls throughout both series. Additional measurements included: plasma volume and red cell mass, urinary sodium and potassium, and peripheral renin activity. The results are discussed in terms of their significance for long-range plans involving the use of artificial gravity as a countermeasure on space missions. (Modified author abstract)

N73-27942/4GA PC$3.25/MF$1.45
Flying Personnel Research Committee, London (England).
COLOUR VISION REQUIREMENTS IN DIFFERENT OPERATIONAL ROLES IN THE ROYAL AIR FORCE.
D. H. Brennan. Nov 72, 22p FPRC/1319

Descriptors: *Color vision, *Flight crews, *Military aviation, Aerospace medicine, Personnel selection.

For abstract, see STAR 1119

6O. Pharmacology

AD-767 257/9GA PC$4.25/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
ATROPINE, SCOPOLAMINE, AND DITRAN: COMPARATIVE PHARMACOLOGY AND ANTAGONISTS IN MAN.
Rept. for Jun 64-Dec 69,
James S. Ketchum, Frederick R. Sidell, Edward B. Crowell, Jr., George K. Aghajanian, and Arthur H. Hayes, Jr. Aug 73, 41p Rept nos. EB-TR-73028, EA-TR-4761

Descriptors: (*Parasympatholytic agents, Pharmacology), (*Cholinesterase inhibitors, Parasympatholytic agents), Toxicity, Pharmacology, Biological assay, Humans, Atropine, Scopolamine.
Identifiers: Ditran.

Atropine, scopolamine, and Ditran, three centrally active anticholinergic compounds, were administered to 158 normal young men in a dose range broader than any previously reported in order for us to study serially their central and peripheral effects. The findings indicate that there are no qualitative differences in the actions of these compounds, but that there are differences in potency, in relative central affinity, and in time course of effects. The toxic effects of belladonna-related substances respond well to certain anticholinesterase substances, such as physostigmine, sarin, and tetrahydroaminoacridine (THA), but not to others (neostigmine and disopropyl phosphorofluoridate (DFP)), nor do they respond to the unrelated drug methylphenidate nor to the phenothiazines. The hallucinations, confusion, and incoherence produced by high doses of anticholinergic compounds seem best classified as simple delirium, rather than as 'psychotomimetic' or 'psychedelic' syndromes. (Author)

AD-767 342/9GA PC$3.50/MF$1.45
Oklahoma Univ Foundation Inc Oklahoma City Medical Center Research and Development Office
PROSTAGLANDINS AND THE LUNG.
Technical rept.,
Jiro Nakano, and Robert B. McCloy, Jr. 18 Jun 73, 57p* Rept no. TR-75
Contract N00014-68-A-0496

Descriptors: (*Carboxylic acids, Pharmacology), (*Lungs, Carboxylic acids), Respiratory system, Respiratory diseases, Physiology, Pathology, Chemotherapeutic agents, Biosynthesis.
Identifiers: *Prostaglandins.

The prostaglandins exert multiple potent pharmacological actions on different organs and tissues including the respiratory system. Although it is rather premature to conclude the precise physiological and pathophysiological roles of prostaglandins at the present time, a large number of recent observations implicate a close relationship between prostaglandins and pathogenesis and clinical manifestations of pulmonary disease. With reasonable certainty, the pathophysiological roles of the prostaglandins in respiratory disease will be clarified, along with a better understanding of pulmonary disease mechanisms. Furthermore, one can anticipate the synthesis of more potent and specific prostaglandin antagonists which may prove valuable in the treatment of respiratory disease. (Author)

AD-767 343/7GA PC$2.75/MF$1.45
Oklahoma Univ Health Sciences Center Oklahoma City
EFFECT OF METHYLPREDNISOLONE ON THE LETHALITY OF ENDOTOXEMIC MICE.
Technical rept.,
Arthur V. Prancan, and Jiro Nakano. 15 Jun 73, 14p Rept no. TR-76
Contract N00014-68-A-0496

Descriptors: (*Corticosteroid agents, *Septicemia), Chemotherapeutic agents, Toxins +

Antitoxins, Escherichia coli, Bacteria, Infections, Mice, Experimental data.
Identifiers: *Toxemias, *Endotoxins, *Prednisolone.

In order to establish a reliable control for E. coli endotoxin studies, the lethality of various doses of endotoxin was tested in mice. Endotoxin (10 mg/kg, i.p. and 30 mg/kg, i.p.) resulted in a lethality of 60% and 87%, respectively. Methylprednisolone given 1 hr before endotoxin increased survival to 75% as compared to the 13% survival of the group which endotoxin alone. Methylprednisolone (30 mg/kg, s.c.) increased survival markedly when given 1 hour before, simultaneous with, and from 1-6 hours after E. coli endotoxin (10 mg/kg, i.p.). Methylprednisolone has both a protective and a therapeutic effect on the survival of mice treated with E. coli endotoxin. (Author)

AD-767 417/9GA Reprint
Freie Universitaet Berlin (West Germany) Physiologisches Institut
EXPERIMENTELLE UNTERSUCHUNGEN UEBER DEN WIRKUNGSMECHANISMUS VON RAUBASIN (LAMURAN (TRADE MARK)) (INVESTIGATIONS ON RAUBASIN (LAMURAN (TRADE MARK)): THE EFFECTS ON THE VEINS),
M. Echt, and L. Lange. 22 Apr 72, 11p AFOSR-TR-73-1871
Contract F44620-71-C-0117
Text in German; summary in English.
Availability: Pub. in the Zeitschrift fuer Kardiologie, v62 n4 p352-359 Apr 73.

Descriptors: (*Reserpine, *Veins), Drugs, Rauwolfia alkaloids, Blood pressure, Blood vessels, Cardiovascular system, West Germany, Blood circulation.

The effects of Raubasin (Lamuran) on the peripheral venous tone, the central venous pressure, the peripheral blood flow, the heart rate and the arterial blood pressure have been studied in 8 volunteers in the prone position in order to ellucidate the mode of action of this drug. Raubasin was administered intravenously 2 times 20 mg Raubasin in an interval of 20 min. In these experiments there was no evidence for the primary venoconstrictive effect of Raubasin as described by other authors. Neither the coefficient of volume elasticity of the forearm nor the central venous pressure showed any significant changes during administration of Raubasin. Only a short lasting elevation of the peripheral venous pressure during administration of Raubasin was observed, which was preceded by a decrease of the peripheral arteriolar resistance. It is concluded that the increase of the peripheral venous pressure during administration of Raubasin is not due to venoconstriction but due to a short lasting increase of peripheral blood flow. (Modified author abstract)

AD-767 418/7GA Reprint
Freie Universitaet Berlin (West Germany) Physiologisches Institut
EFFECTS OF PROSTAGLANDIN ON CUTANEOUS ARTERIES AND VEINS IN VIVO IN THE ISOLATED RABBIT EAR,
Martin Echt, Otto H. Gauer, Friedrich Kapteina, and Lothar Lange. 1973, 9p AFOSR-TR-73-1856
Contract F44620-71-C-0117
Availability: Pub. in the Advances in the Biosciences, v9 p353-358 1973.

Descriptors: (*Blood vessels, *Carboxylic acids), Skin, Ear, Drugs, Dosage, Blood circulation, Blood pressure, Rabbits, Experimental data, West Germany.
Identifiers: *Prostaglandins.

The dose dependent effects of i.a. PGF(2 alpha) and PGE(2) on cutaneous arteries and veins were studied at constant blood flow. Norepinephrine served as the standard vasoconstrictive agent. Changes in arteriolar resistance, venous diameter, and venous pressure gradient were measured. PGF(2 alpha) caused vasoconstriction of arterial and venous vessels. The doses of PGF(2 alpha) required to produce a given response in veins were ten times greater than the dose of norepinephrine needed to obtain the same response. On the arterial side, this relationship was 30:1. The constrictive effects of PGF(2 alpha) were completely eliminated by infusion of papaverine. Spontaneous rhythmic contractions of the venous vessels down to a size of 50 micrometers were observed consistently in these experiments. The frequency increased significantly with increasing PGF(2 alpha) concentration. The effects of PGE(2) were studied during norepinephrine constriction. PGE(2) abolished the effects of norepinephrine completely on the venous side and incompletely on the arterial side. (Author)

AD-767 553/1GA PC$3.00/MF$1.45
Utah Univ Salt Lake City Dept of Psychology
A NEUROPSYCHOLOGICAL CLASSIFICATION OF DRUG SUBSTITUTION.
Progress rept. no. 4 (Annual),
Harold C. Nielson. Sep 73, 12p
Contract DADA17-73-C-3029

Descriptors: (*Barbiturates, Substitutes), (*Brain, *Psychotropic agents), Thresholds(Physiology), Drugs, Cats, Experimental data, Conditioned reflex, Dosage, Addiction.
Identifiers: Pentobarbitol, Psychoneuropharmacology, Avoidance responses.

Cats have been trained to give conditioned avoidance responses with direct electrical stimulation of the brain as the conditioned stimulus. After these conditioned responses were established the brain excitability levels, as measured by the intensity of brain stimulation necessary to maintain those conditioned responses, were determined. The effects of various dosages of paraldehyde, meprobamate, chloral hydrate, and chlordiazepoxide, upon brain excitability levels was determined for cats trained in the normal, nondrugged state. Additional cats have received the same avoidance training while they are in a drugged state, produced by injections of 12.5 mg/kg of pentobarbital, to produce state dependent responding. They will shortly be tested to determine whether, and at what dosage, paraldehyde, chloral hydrate, meprobamate and chlordiazepoxide can substitute for pentobarbital and maintain the state dependent responding. Barbiturate dependence has been produced in two cats and the brain excitability levels followed while dependence was being produced, and during withdrawal when pentobarbital was withheld. The data showed that the thresholds of the CNS were elevated while dependence was being produced and remained elevated while the animal showed the most severe withdrawal symptoms. (Author)

BNL-17784/GA PC$5.50/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EFFECT OF CALCITONIN ON CALCIUM METABOLISM IN THE RAT.
C. S. Dombrowski, K. K. Shukla, and S. H. Cohn. 1972, 68p

Descriptors: (*Calcium, *Metabolism), Drugs, Rats, Response modifying factors.

For abstract, see NSA 28 02, number 05002.

PATENT-3 725 295/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
TECHNETIUM LABELING.
Patent,
William C. Eckelman, and Powell Richards. Filed 20 Jul 71, patented 3 Apr 73, 3p PAT-APPL-164 431
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Isotopic labeling), (*Technetium, *Isotopic labeling), Technetium compounds, Chelation, Tin organic compounds.
Identifiers: PAT-CL-252-301-1-R, *Radiopharmaceutical agents, Technetium 99.

The patent describes a process of using (99m)Tc in a radiopharmaceutical. This comprises the use of a stannous ion as the reducing agent with the pertechnetate ion containing the radionuclide.

PB-223 200/7GA PC$3.50/MF$1.45
Federation of American Societies for Experimental Biology, Bethesda, Md.
ROLE OF THE CLINICAL PHARMACOLOGIST IN DIRECT PATIENT CARE.
Final rept. 1 Jan-31 Dec 72,
C. Jelleff Carr. Dec 72, 57p* BHSRE-74-3 HSM-110-72-112

Descriptors: (*Pharmacology, *Clinical medicine), (*Medical personnel, Pharmacology), Drug therapy, Hospitals, Manpower utilization, Training, Benefit cost analysis, Evaluation.
Identifiers: Bureau of Health Services Research and Evaluation, *Clinical pharmacology.

The study examines the present medical care systems that utilize the skills of the clinical pharmacologist in providing rational drug therapy. It reviews and analyzes the professional contributions and responsibilities of the clinical pharmacologist and factors of drug therapy that influence the quality of drug therapy, adverse drug reactions and interactions, and costs of health care delivery. The current and proposed training programs in clinical pharmacology are reviewed. Manpower studies illustrate that although the demands for clinical pharmacologists are recognized, there is no national program that is training these medical specialist to meet the anticipated needs. The relationships of the clinical pharmacologist to the nurse specialist and the clinical pharmacist are noted as these health care personnel are involved in drug therapy for patients. The role of the hospital administrator in controlling hospital care costs as related to drug therapy is discussed.

PB-223 772-T/GA PC$3.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
TEST-SYSTEM WITH A LYSOGENIC STAPHYLOCOCCUS MODEL FOR PRIMARY SELECTION OF ANTINEOPLASTIC AGENTS,
A. Z. Smolyanskaya, and F. I. Leikina. Sep 73, 9p NIH-74-104C
Trans. of Farmakologiya i Toksikologiya (USSR) v33 n4 p479-485 1970.

Descriptors: (*Antineoplastic agents, Staphylococcus), (*Staphylococcus, Indicator species), Pharmacology, Bacteria, Models, Drugs, Bacteriophages, Antimetabolites, Antibiotics, Hormones, Antiinfectives and antibacterials, Translations, USSR.

The paper is a report of a test-system which permits simultaneous evaluation of the bacteriostatic, antiphage and phage inducing effect of various drugs by the use of a lysogenic Staphylococcus model and an indicator strain; this triple effect is made possible by diffusion of the drugs in semiliquid agar containing a mixture of these strains. The catagories of drugs tested were antimetabolites, alkylating drugs, antineoplastic antibiotics, antibacterial drugs, carcinogenic agents and hormones. Concentrations of the drug being evaluated were established in proportion to the distance from the holes in which the test drug was imbedded in the medium. Observation showed that antineoplastic antibiotics and antimetabolites produced induction of phage and/or exerted antiphage action in 100% of the cases. Alkylating agents showed such properties in 7 out of 10 cases. It was proposed from data obtained that the test system of lysogenic and phage sensitive Staphylococci would be feasible in the preliminary selection of potentially active antineoplastic antibiotics and antimetabolites.

SGAE-2108/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie, G.M.B.H., Seibersdorf. Institut fuer Biologie.
INHIBITION OF XANTHINE OXIDASE BY ADDITIVES USED IN PHARMACEUTICAL INDUSTRY.
G. Partsch, and H. Altmann. Mar 73, 8p
U.S. Sales Only.

Descriptors: (*Oxidases, *Inactivation), Biochemical reaction kinetics, Chemical properties, Detergents, Oxidoreductases.

For abstract, see NSA 28 03, number 07781.

6P. Physiology

AD-767 040/9GA PC$4.00/MF$1.45
Pennsylvania Univ Philadelphia Dept of Physiology
CONTRIBUTIONS OF RODS AND CONES TO VISUAL THRESHOLDS DURING DARK ADAPTATION,
John Lott Brown, Alan Kirschenstein, and Floyd Shupp. 1960, 40p
Contract Nonr-551(39)

Descriptors: (*Night vision, Thresholds(Physiology)), (*Retina, Night vision), Adaptation(Physiology), Eye, Vision.
Identifiers: *Dark adaptation, Cones(Retina), Rods(Retina).

The spectral sensitivity of the retinal receptors may deviate appreciably from that which would be assigned to them on the basis of either scotopic or photopic luminosity standards. Both the initial 'cone' branches and the secondary 'rod' branches of dark adaptation curves were found to deviate from predicted positions on a scotopic scale of luminance. These results illustrate the importance of empirical evaluations in any situation where the most efficient use of illumination may be essential. In the design of a cockpit lighting system for example, serious errors may be introduced by dependence upon luminosity standards for the determination of energy levels required for visual tasks under various spectral conditions of illumination.

AD-767 320/5GA PC$2.75/MF$1.45
Naval Air Development Center Warminster Pa Crew Systems Dept
DETECTION OF SHORT-DURATION LIGHT SIGNALS PRESENTED IN THE PERIPHERY.
Progress rept.,
Robert M. Herrick. 22 May 73, 25p Rept no. NADC-73115-40

Descriptors: (*Visual perception, Signal lights), Vision, Thresholds(Physiology), Psychophysics, Impact flash.
Identifiers: Peripheral vision.

While viewing the terrain or some visual display device, naval personnel must attend to signals presented in the periphery. Whether such signals are detected depends upon the luminance of the signals, the duration of the signals, the interval of time separating successive signals, and the number of signals presented. These four visual variables were examined, in psychophysical experiments, and simple empirical laws were derived to describe the relations among the variables. (Modified author abstract)

AD-767 322/1GA MF$1.45
Naval Air Development Center Warminster Pa Crew Systems Dept
FREQUENCY THRESHOLDS FOR TWO FLASH FLICKER AND CRITICAL FLICKER: WHY THEY DIFFER.
Progress rept.,
Robert M. Herrick. 8 Jun 73, 22p Rept no. NADC-73131-40
Availability: Available in microfiche only.

Descriptors: (*Visual perception, Thresholds(Physiology)), Impact flash, Frequency, Perception.
Identifiers: *Flicker, *Critical flicker frequency.

The minimum interval detectable between two successive light flashes is longer than the minimum interval detectable when many flashes are viewed. The probability summation hypothesis is suggested to explain the difference. For a given flash duration, the minimum interval detectable decreases as a function of the number of flashes n, until n equals about 8 or 10; further increases in n cause no further changes in this interval. Of the total decrease in the interval from 2 to 99 flashes, about 90% is explained by the probability summation hypothesis. (Author)

AD-767 385/8GA PC$3.00/MF$1.45
Stanford Univ Calif Dept of Physiology
PROSTAGLANDIN RELEASE AND METABOLISM DURING DIFFERENT PHYSIOLOGICAL STATES.
Final rept. 1 Jul 70-28 Feb 73,
Peter W. Ramwell. 28 Feb 73, 12p Rept no.
N00014-67-A-0112-0055

Descriptors: (*Carboxylic acids, *Blood platelets), (*Blood transfusions, Carboxylic acids), (*Blood platelets, Storage), Metabolism, Enzymes, Salicylic acids, Molecular structure, Storage, Preservation, Fevers, Hematology.
Identifiers: *Prostaglandins, *Blood preservation.

The work performed resulted in the development of an improved method for the separation and storage of platelets for transfusion purposes. Basic studies have explored potential side effects, prostaglandin metabolism, prostaglandin binding to plasma constituents, prostaglandin enzyme sites of action and finally the stereochemical requirements of prostaglandins for biological activity.

AD-767 416/1GA Reprint
Freie Universitaet Berlin (West Germany) Physiologisches Institut
DISTRIBUTION AND CIRCULATION OF EXTRACELLULAR FLUID AND PROTEIN DURING DIFFERENT STATES OF HYDRATION IN THE CAT,
G. Schultze, K. Kirsch, and L. Roecker. 9 Aug 72, 18p AFOSR-TR-73-1872
Contract F44620-71-C-0117
Availability: Pub. in the Pflugers Arch, v337 p351-366 1972.

Descriptors: (*Dehydration, *Body fluids), (*Proteins, Dehydration), Blood plasma, Blood volume, Lymph, West Germany.
Identifiers: *Hydration.

The aim of the present study was to investigate the distribution of fluid and protein between the intra- and extravascular spaces under control conditions and after dehydration with subsequent rehydration. Furthermore, the factors which determine this characteristic distribution were investigated. Therefore the extracellular fluid space, the plasma volume, and the circulating protein as well as the transcapillary transport of albumin and the lymph flow of the thoracic duct were measured.

AD-767 446/8GA Reprint
California Univ Santa Barbara Inst of Environmental Stress
VALIDATION OF OPEN-CIRCUIT METHOD FOR THE DETERMINATION OF OXYGEN CONSUMPTION,
Jeames A. Wagner, Steven M. Horvath, Thomas E. Dahms, and Sharon Reed. 18 Dec 72, 7p
AFOSR-TR-73-1857
Grant AF-AFOSR-1653-69
Availability: Pub. in Jnl. of Applied Physiology, v34 n6 p859 863 Jun 73.

Descriptors: (*Oxygen consumption, Measurement), Exercise, Respiration, Carbon dioxide, Oxygen, Nitrogen.

Seventy-two measurements of respiratory exchange by both the open- and closed-circuit methods were made on ten subjects at rest or during steady-state treadmill work (5.6 km/hr, 0% and 7% grades) in a post absorptive state or 1-3 hr after eating a 61-g protein meal. Inspired nitrogen minute volume was the same as expired nitrogen minute volume. Oxygen consumption (Vo2), as measured by the open-circuit method, was an average of 1.1% higher, ranging from 5.5% higher to 4.7% lower, than the values obtained by the closed-circuit method. The average difference would have been reduced to 0.5% if the measured room air gas percentages (20.91% O2, 0.03% CO2, and 79.06% N2) had been used for the open-circuit method rather than the classical values. Carbon dioxide production (Vc02) was equal regardless of method, and respiratory exchange ratios varied in relationship to differences in Vo2. The results confirm the validity of using the open-circuit method for determining respiratory exchange in man. (Author)

AD-767 482/3GA Not available NTIS
Mcgill Univ Montreal (Quebec) Drb Aviation Medical Research Unit
OBSERVATIONS ON THE CONTROL OF STEPPING AND HOPPING MOVEMENTS IN MAN,
G. Melvill Jones, and D. G. D. Watt. 13 Jul 71, 19p
Availability: Pub. in Jnl. of Physiology, v219 p709-727 1971.

Descriptors: (*Legs, Reflexes), Motion, Muscles, Electromyography, Control, Physiology.
Identifiers: *Stretch reflex.

The presence of a form of stretch reflex, previously described in the arm by other authors, has been confirmed in the gastrocnemius muscle of the human leg. The electromyographic (e.m.g.) manifestation of this reflex occurred 120 msec following a sharply applied, and maintained, dorsiflexing force to the foot. This form of response is referred to in this article as the functional stretch reflex (FSR). To determine the contribution of the FSR to the control of normal leg movement, the e.m.g. activity in the above muscle was monitored during single downward steps of 12.7, 25.4 and 38.1 cm and during repetitive, rhythmic, hopping movements on one foot. It was found that e.m.g. activity associated with steps to the ground began 141 msec after contact, when the e.m.g. usually became temporarily inactive. It is inferred from these results that the muscular deceleration associated with landing was brought about by the release of a preprogrammed pattern of neuromuscular activity which was inaccessible to reflex activity resulting from the mechanical event of landing, rather than by a stretch reflex.

AD-767 638/0GA PC$5.50/MF$1.45
Naval Postgraduate School Monterey Calif
FLUID FLOW IN THE LUNG: A SURVEY. NUMERICAL SOLUTION FOR GAS MIXING IN A SIMPLE MODEL OF THE LUNG, AND EXPERIMENTAL STUDY OF FLOW IN A THIN-WALLED COLLAPSIBLE TUBE.
Master's thesis,
Jan David Janiec. Jun 73, 66p

Descriptors: (*Lungs, *Fluid flow), Fluid dynamics, Gas flow, Capillaries, Blood circulation, Numerical analysis, Models(Simulations), Theses.

The range of fluid dynamics applications in the lung is vast, encompassing many interesting problems rarely touched in any other single engineering area. A survey of recent work in this field was a simple model of the lung was developed indicating its application to a wide range of similar problems. Finally, new parameters were experimentally investigated in flow

through a thin-walled collapsible tube. Results indicated the effects of the parameters to be significant in the flow of blood in the pulmonary capillaries as controlled by the surrounding aveolar pressure. (Author)

AD-767 647/1GA PC$2.75/MF$1.45
Naval Air Development Center Warminster Pa Crew Systems Dept
PROBABILITY OF DETECTING TWO DIM VISUAL SIGNALS AS A FUNCTION OF THEIR TEMPORAL SEPARATION.
Progress rept.,
Robert M. Herrick. 19 Jul 73, 22p Rept no. NADC-73163-40

Descriptors: (*Visual signals, *Detection), (*Visual acuity, *Thresholds(Physiology)), Performance tests, Theory, Frequency, Flash lamps, Low-intensity illumination, Mathematical prediction, Probability.
Identifiers: TEpee effect, Intervals.

Dim visual signals presented on visual display devices or in the natural environment may be undetected, or may be detected only occasionally. The problem considered is how often two dim flashes are detected and how does the frequency of detection vary with the interval separating the two flashes. Four empirical laws, collectively termed the TEpee effect, were recently suggested to describe the interaction of two flashes in determining the light detection threshold as a function of the interval between the flashes. Based on the TEpee effect, with two constant-duration-luminance, constant flashes, predictions were derived on the probability of detection. (Modified author abstract)

AD-767 649/7GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Crew Systems Dept
OPTICAL EFFECTS OF PIGMENTATION ON TEMPERATURE RISE IN A TWO-LAYER SKIN SIMULANT SYSTEM DURING IRRADIATION.
Interim rept.,
John R. Piergallini, and Alice M. Stoll. 31 Oct 72, 50p Rept no. NADC-72225-CS

Descriptors: (*Skin, Thermal conductivity), (*Organic pigments, Thermal conductivity), Optical properties, Body temperature, Mathematical models.
Identifiers: Irradiation.

It is demonstrated that from a knowledge of the thermal and optical properties of each layer of a two-layer system, together with the amplitude and distribution of the energy input, it is possible to predict temperature rises at depth in the second layer of a two-layer system. By varying the optical properties of the first layer and observing the temperature rises at depth in the second layer, the experimental results can be used to verify mathematical expressions for optical and heat transfer processes of the two layers. Such a system was devised to determine the thermal conductivity between a silicone rubber patch and the living skin irradiated. It may also be used in evaluations of other two-layer systems where reflectance, transmittance and heat transfer properties are known and must be accounted for in the mathematical model. (Author)

CEA-R-4421/GA PC$10.50/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
EFFECT OF LACTOSE ON INTESTINAL ABSORPTION OF CALCIUM.
M. L. Labat. 1973, 168p
In French. U.S. Sales Only.

Descriptors: (*Calcium, *Intestinal absorption), Lactose, Rats, Response modifying factors, Vitamin d.

For abstract, see NSA 28 03, number 07675.

COO-1602-35/GA PC$3.00/MF$1.45
Utah State Univ., Logan. Dept. Of Zoology.
MODULATION OF RABBIT TESTICULAR CONTRACTIONS BY PROSTAGLANDINS, STEROIDS, AND SOME PHARMACOLOGICAL COMPOUNDS.
R. R. Seeley, J. L. Hargrove, J. M. Johnson, and L. C. Ellis. 26 Jun 72, 8p
Contract AT(11-1)-1602

Descriptors: (*Testes, *Physiology), Additives, Biological effects, Hormones, In vitro, Rabbits, Steroids.

For abstract, see NSA 28 02, number 05014.

COO-3139-5/GA PC$3.75/MF$1.45
Connecticut Univ., Storrs. Dept. Of Animal Genetics.
PROTEINS IN GROWTH REGULATION DURING EARLY DEVELOPMENT OF THE CHICK EMBRYO. PROGRESS REPORT, MAY 1972--MAY 1973.
N. W. Klein. 1973, 31p
Contract AT(11-1)-3139

Descriptors: (*Embryos, *Growth), Chickens, Proteins.

For abstract, see NSA 28 03, number 07708.

COO-3139-7/GA PC$5.75/MF$1.45
Connecticut Univ., Storrs. Dept. Of Animal Genetics.
PROTEIN NUTRITION IN GROWTH REGULATION DURING EARLY DEVELOPMENT.
N. W. Klein. 1973, 71p
Contract AT(11-1)-3139

Descriptors: (*Proteins, Embryos), (*Embryos, *Animal growth), Chickens, Mammals, Nutrients.

For abstract, see NSA 28 03, number 07709.

EUR-4864/GA PC$8.50/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
IODINE METABOLISM IN CHILDREN AND ADOLESCENTS IN A REGION OF THE EEC.
L. Karhausen, J. P. Pages, G. Vacca, A. Piepz, and M. de Visscher. Mar 73, 128p
In French. U.S. Sales Only.

Descriptors: (*Children, *Metabolism), (*Iodine, Metabolism), Age groups, Biological models, Growth, Thyroid, Tracer techniques.

For abstract, see NSA 28 02, number 05023.

ORO-4025-2/GA PC$3.00/MF$1.45
Baylor Univ., Houston, Tex. (Usa). Dept. Of Biochemistry.
STUDIES ON THE ROLE OF NERVE IN AMPHIBIAN LIMB REGENERATION. FINAL REPORT.
M. H. Dresden. Feb 73, 14p
Contract AT(40-1)-4025

Descriptors: (*Amphibians, *Biological regeneration), Injuries, Limbs, Nervous system, Physiology.

For abstract, see NSA 28 03, number 07762.

ORO-4056-3/GA PC$3.00/MF$1.45
Baylor Univ., Dallas, Tex. (Usa). Coll. Of Dentistry.
INTRACELLULAR TRANSPORT OF IONS IN MINERALIZING TISSUES. PROGRESS REPORT, JUNE 1, 1972--FEBRUARY 28, 1973.
J. L. Matthews. 1973, 5p
Contract AT(40-1)-4056

Descriptors: (*Phosphorus, *Metabolism), (*Calcium, Metabolism), Mineralization, Rats, Skeleton, Tissue distribution, Tracer techniques, Vitamin d.

For abstract, see NSA 28 03, number 07763.

ORO-4056-4/GA PC$3.00/MF$1.45
Baylor Univ., Dallas, Tex. (Usa). Coll. Of Dentistry.
INTRACELLULAR TRANSPORT OF IONS IN MINERALIZING TISSUES. COMPREHENSIVE PROGRESS REPORT, JUNE 1970--FEBRUARY 1973.
J. L. Matthews. 1973, 18p
Contract AT(40-1)-4056

Descriptors: (*Phosphorus, *Tissue distribution), Cartilage, Kidneys, Metabolism, Mineralization, Rats, Skeleton, Small intestine, Tracer techniques.

For abstract, see NSA 28 03, number 07764.

RT/BIO-(72)76/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
LIVING STATE PHYSICS. THE PIEZOELECTRIC EFFECT AS UNIFYING HYPOTHESIS FOR FUNCTIONAL AND STRUCTURAL PROCESSES IN BIOLOGICAL MEMBRANES: PRELIMINARY REMARKS.
G. Caserta, and T. Cervigni. 21 Dec 72, 16p
U.S. Sales Only.

Descriptors: (*Membranes, *Piezoelectricity), (*Cell membranes, Piezoelectricity), Hypothesis, Invariance principles, Ions, Transport.

For abstract, see NSA 28 02, number 05062.

UR-3490-199/GA PC$4.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
NATURE OF THE MEMBRANE SITES CONTROLLING ANION PERMEABILITY OF HUMAN RED BLOOD CELLS AS DETERMINED BY STUDIES WITH DISULFONIC STILBENE DERIVATIVES.
Z. I. Cabantchik, and A. Rothstein. 39p

Descriptors: (*Erythrocytes, *Permeability), Anions, Aromatics, Biological effects, Drugs, In vitro, Man, Membranes, Sulfonic acids.

For abstract, see NSA 28 02, number 05078.

UR-3490-97/GA PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa). Dept. Of Biophysics.
CALCIUM TRANSPORT IN THE SMALL INTESTINE.
R. R. Warner, and J. R. Coleman. 1972, 4p CONF-720714-3
Contract AT(11-1)-3490

Descriptors: (*Calcium, *Intestinal absorption), Chickens, In vitro, Metabolism, Rats, Small intestine, Tracer techniques, Vitamin d.

For abstract, see NSA 28 03, number 07820.

6Q. Protective Equipment

N73-27078/7GA PC$3.50/MF$1.45
BioTechnology, Inc., Falls Church, Va.
PROTECTION AGAINST HEARING LOSS IN GENERAL AVIATION OPERATIONS, PHASE 2. Final Report.
J. F. Parker, Jr.. Sep 72, 26p NASA-CR-133303
Contract NASW-2265

Descriptors: *Auditory defects, *Ear protectors, *General aviation aircraft, *Hearing, Aircraft, Noise injuries, Noise reduction.

For abstract, see STAR 1118

PATENT-3 725 173/GA Not available NTIS
Department of the Navy Washington D C
METHOD OF MAKING A PROTECTIVE DIVING SUIT.
Patent,
Clarence S. Johnson, and Arthur F. Langguth.
Filed 13 Jan 72, patented 3 Apr 73, 5p Rept nos.
PAT-APPL-217 481,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Underwater clothing, Manufacturing methods), (*Patents, Underwater clothing), Protective clothing, Human engineering, Design.
Identifiers: PAT-CL-156-250.

The invention is directed to providing a protective diving suit and a method of fabrication including an inner layer of neoprene having successive rows of interconnected plastic chips layered and resiliently bonded in place in a 'fish scale like' fashion. An outer layer of neoprene covers the bonded rows and a liquid resilient adhesive is injected through small punctures in the outer neoprene layer to cover the layered rows and fill voids between them and the outer neoprene layer. After drying, the laterally reaching rows, now bonded in place, are flexed in a direction perpendicular to their direction of alignment to break small interconnecting portions previously holding the aligned adjacent plastic chips together. Thusly flexed and broken, the interlayered rows of chips are free for independent motion as a diver performs his tasks.

6R. Radiobiology

AD-767 268/6GA PC$4.25/MF$1.45
Walter Reed Army Inst of Research Washington D C
DIGEST OF PAPERS. JOINT U.S. ARMY/GEORGIA INSTITUTE OF TECHNOLOGY MICROWAVE DOSIMETRY WORKSHOP 1-2 JUNE 1972.
H. Mark Grove. 2 Jun 72, 109p

Descriptors: (*Microwaves, Dosimeters), Radiological dosage, Electromagnetic waves, Radiation effects, Radiation hazards.
Identifiers: *Microwave radiobiology.

The objective of the workshop was to interchange the latest information on techniques of electromagnetic measurements in a biological research context. This report is a compilation of summaries of the papers which were presented. (Modified author abstract)

AD-767 583/8GA PC$3.00/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
COMPARISON OF THE 60-DAY MORTALITY RESPONSES OF LAMBS AND ADULT SHEEP AFTER UNILATERAL EXPOSURE TO COBALT-60 GAMMA RADIATION.
Technical rept. 30 Jun 69-17 Apr 70,
Stanley G. Spangler, and Carl T. Olson. Sep 73, 30p Rept no. AFWL-TR-73-126

Descriptors: (*Radioactive isotopes, *Mammals), (*Gamma rays, Mammals), Radiation effects, Mortality rates, Animals, Radiological dosage, Lethal dosage.
Identifiers: *Cobalt 60, Cobalt isotopes, Sheep.

Fifty-three lambs and 24 adult sheep were exposed unilaterally (right side) to potentially lethal doses of cobalt-60 gamma radiation (200 to 500 R, midline air dose). The incidence of mortality during the first 60 days post-exposure was recorded and analyzed. The median lethal dose (LD-50) for the lambs was 347 R, and the slope of the probit regression line was 22.24 probits per decade increase in dose. For the adults the LD-50 was 381 R, and the slope was 4.25 probits per decade increase in dose. Compared to other sheep mortality data, the slope of adult line was unusually small; and it is questionable as to whether or not it is a close approximation to that of the entire population. The average day of death for those lambs which died within the first 60 days post-exposure was 21.3 days. Both the average and standard deviation were significantly smaller than those reported elsewhere for bilaterally exposed adults. On the basis of the available data, it appears that the difference in averages can be attributed to the youth of the lambs rather than to the exposure aspect. (Modified author abstract)

AD-767 585/3GA PC$3.00/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
X-RAY FLUOROMETER AND SOLID-STATE DETECTOR CALIBRATION FOR BIOLOGIC SPECIMEN ANALYSIS.
Final rept. Jun-Dec 72,
Ted D. Rupp, and John L. Montet. Aug 73, 42p*
Rept no. SAM-TR-73-17

Descriptors: (*X-ray spectroscopy, Body fluids), (*Radiofrequency, *Body fluids), (*Radiation hazards, Radiofrequency), Fluorescence, Spectrum analyzers, Metals, Radiobiology, Microwaves.
Identifiers: *Fluorometers, Solid state devices, *X-ray fluorescence.

Due to the recent demand for data concerning radiofrequency (RF) hazards to man, extensive information is now needed on the normal metabolites of experimental animals exposed to various RF fields. The metal content of blood plasma is known to respond to various thermal environments. This response is thought to be the primary means by which RF fields affect most biologic systems. X-ray fluorescence has recently been shown to be a feasible technique, by means of using lithium-drifted silicon or germanium solid-state detectors, for the simultaneous determination of several metals in biologic samples. This report describes the source arrangement and calibration of such a fluorometer, as well as the calibration of the solid-state detectors in the 3.5 Kev to 3.5 Mev energy region. Also included is the application of the completed apparatus to x-ray fluorescence analysis of biologic systems. (Modified author abstract)

AD-767 633/1GA PC$3.00/MF$1.45
Lovelace Foundation for Medical Education and Research Albuquerque N Mex
DELAYED MATCH-TO-SAMPLE PERFORMANCE DECREMENT IN MONKEYS FOLLOWING COBALT-60 IRRADIATION.
Topical rept.,
Alfred Bruner, Victor Bogo, and Robert K. Jones. 10 Aug 73, 48p DNA-3159T
Contract DASA01-70-C-0059

Descriptors: (*Radioactive isotopes, Performance(Human)), (*Gamma rays, Performance(Human)), Radiation effects, Monkeys, Radiological dosage, Behavior, Visual perception, Memory.
Identifiers: *Cobalt 60.

The report presents findings on the behavioral effects of Cobalt-60 gamma irradiation on monkeys performing a complex delayed match-to-sample (DMTS) task or a simpler visual memorization task. It was found that the DMTS group reflected clear performance decrement at lower doses (e.g., several hundred rads midbody) than previously reported, while the memorization animals tended to show either no decrement or, in a few cases, response cessation (i.e., early transient incapacitation). The latter result has been characteristic of simple visual discrimination tasks when radiation doses of approximately 1000 rads have been employed. The differences between the two present groups, and the contrasts drawn with previous studies, were explained as a function of greater complexity of the DMTS task and an improved scoring procedure for performance decrement.

AECL-4451/GA PC$7.50/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, OCTOBER 1--DECEMBER 31, 1972.
Mar 73, 107p PR-B-96
U.S. Sales Only.

Descriptors: (*Biochemistry, *Research programs), Chalk river nuclear labs, Cobalt 60, Contamination, Ecology, Geophysics, Hydrology, Lakes, Ottawa river, Strontium 90, Thermal pollution, Biological radiation effects, Chromosomes, Embryos, Fishes, Human populations, Spermatozoa, Biology, Radiation protection, Insects, Mutations, Radioinduction, Yeasts, Biosynthesis, Dna, Escherichia coli, Gamma radiation, Micrococcus radiodurans, Molecular biology, Photon beams, Proteins, Radiosensitizers, Ultraviolet radiation, Air, Earth atmosphere, Monitoring, Neutron dosimetry, Reactors, Thermoluminescent dosemeters, Tritium, Water.

For abstract, see NSA 28 03, number 05537.

BNL-17657/GA PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N. Y.
CYCLOTRON AND SHORT-LIVED HALOGEN ISOTOPES FOR RADIOPHARMACEUTICAL APPLICATIONS.
R. M. Lambrecht, and A. P. Wolf. 1973, 22p
CONF-730309-5, SM-171/79

Descriptors: (*Iodine 123, *Isotope production), (*Fluorine 18, Isotope production), Carrier-free isotopes, Cyclotrons, Nuclear reactions, Purification.

For abstract, see NSA 28 02, number 02458.

BNL-17725/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
APPLICATION OF PROTON RADIATION THERAPY.
J. O. Archambeau, G. W. Bennett, and G. S. Levine. 1973, 4p CONF-730310-38

Descriptors: (*Proton beams, *Depth dose distributions), (*Neoplasms, *Radiotherapy), Biological radiation effects, Comparative evaluations, Energy range, Mev range 100-1000, Radiation doses, Rbe, X radiation.

For abstract, see NSA 28 02, number 02881.

BNL-17796/GA PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EVALUATION OF ACCIDENTAL EXPOSURE TO ACCELERATOR PERSONNEL.
C. H. Distenfeld, R. D. Colvett, and J. A. Ash. 4 Apr 73, 23p

Descriptors: (*Personnel dosimetry, *Radiation accidents), Biological dosemeters, Calibration standards, Chemical composition, Geiger-mueller counters, Irradiation, Measuring methods, Personnel, Phantoms, Radiation doses, Radioactivation, Testing, Whole-body counters.

For abstract, see NSA 28 03, number 05963.

BNWL-SA-3390/GA PC$5.00/MF$1.45
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICE.
C. M. Unruh. Jul 70, 56p

Descriptors: (*Tritium, *Materials handling), Chemical properties, Manuals, Personnel, Personnel dosimetry, Radiation protection, Tritium compounds.

For abstract, see NSA 28 03, number 05964.

BNWL-SA-4487/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
MINICOMPUTER CONTROL OF AEROSOL INHALATION EXPOSURES.
P. J. Dionne, D. K. Craig, and J. R. Decker. 1973, 14p CONF-730508-1
Contract AT(45-1)-1830

Descriptors: (*Radioactive aerosols, *Retention), (*Respiratory tract, *Radiation doses), (*Radionuclide administration, *Data acquisition systems), Air samplers, Animal cells, Breath, Computer calculations, Dogs, Exhalation, Inhalation, Labelled compounds, Particle size, Plutonium oxides, Plutonium 239, Radiometric analysis, Radionuclide kinetics, Time dependence.

For abstract, see NSA 28 03, number 06069.

BNWL-SA-4531/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. Oregon State Univ., Corvallis. Dept. Of General Science.
LETHAL AND MUTAGENIC RESPONSES OF CHLAMYDOMONAS REINHARDI TO 1.55 MEV PROTON IRRADIATION.
L. A. Braby, and D. S. Nachtwey. 1973, 14p
CONF-730431-2
Contract AT(45-1)-1830

Descriptors: (*Algae, *Mutations), (*Protons, *Rbe), Biological radiation effects, Cell cycle, Energy range, External irradiation, Mev range 100-1000, Radioinduction, Response modifying factors, Survival curves, Survival time, Synchronous cultures.

For abstract, see NSA 28 03, number 05938.

BNWL-SA-4659/GA PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
CARCINOGENICITY OF INHALED PLUTONIUM-238 IN THE RAT.
C. L. Jr. Sanders. 1972, 40p CONF-730603-2
Contract AT(45-1)-1830

Descriptors: (*Plutonium 238, *Biological radiation effects), (*Lungs, Neoplasms), (*Skeleton, Neoplasms), (*Neoplasms, *Radioinduction), Carcinogenesis, Dose-response relationships, Inhalation, Plutonium oxides, Radiation doses, Radioactive aerosols, Radionuclide kinetics, Rats, Retention.

For abstract, see NSA 28 03, number 06070.

BNWL-SA-4667/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
MODELS FOR INACTIVATION BETWEEN HITS.
W. C. Roesch. 2 Apr 73, 8p CONF-730431-1
Contract AT(45-1)-1830

Descriptors: (*Animal cells, *Biological radiation effects), (*Radiation injuries, *Mathematical models), Biological models, Cell nuclei, Equations, External irradiation, Fractionated irradiation.

For abstract, see NSA 28 03, number 05905.

BRH/OBD-73-2/GA PC$5.45/MF$1.45
Food and Drug Administration, Rockville, MD. (Usa).
STATE RADIATION CONTROL LEGISLATION, 1971.
L. A. Miller. Jul 72, 60p

Descriptors: Atomic energy laws, Legal aspects, Radiation protection.

For abstract, see NSA 28 03, number 07619.

CEA-N-1586/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
APPLICATION OF RADIOTHERMOLUMINESCENT DOSIMETRY TO EXPERIMENTS IN SPACE BIOPHYSICS (EXPERIMENTS CONDUCTED FOR THE WORKING GROUP ON SPACE BIOPHYSICS).
G. Portal. Dec 72, 15p
In French. U.S. Sales Only.

Descriptors: (*Rpl dosemeters, *Performance), Additives, Apollo project, Balloons, Biophysics, Calcium sulfates, Dysprosium, Radiation doses, Sensitivity, Space flight.

For abstract, see NSA 28 02, number 02680.

CEA-R-4405/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
INFLUENCE OF COMPLEXING MOLECULES ON THE BIOLOGICAL BEHAVIOR OF RADIOCERIUM IN THE RAT PLASMA.
R. Masse, C. Giuliano, B. Arnoux, I. L'Hullier, and J. Lafuma. Mar 73, 19p
In French. U.S. Sales Only.

Descriptors: (*Blood plasma, *Radionuclide kinetics), (*Cerium 144, *Metabolism), Carbonates, Citrates, Complexes, Edta, Kidneys, Lactic acid, Quantity ratio, Rats.

For abstract, see NSA 28 02, number 02991.

CNEA-324/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
COMPARATIVE STUDY OF THE METABOLISM IN RATS OF EXP 210 PB AND EXP 210 PO.
D. Beninson, G. Nowotny, D. Guerrien, and N. Bonino. 1972, 12p
In Spanish. U.S. Sales Only.

Descriptors: (*Lead 210, *Metabolism), (*Polonium 210, Metabolism), (*Blood, *Radionuclide kinetics), (*Bone tissues, Radionuclide kinetics), Radiation doses, Rats, Retention.

For abstract, see NSA 28 02, number 02992.

CNEA-329/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
DOSIMETRY AT THE HANDS DURING THE HANDLING OF /SUP 113M/IN.
A. C. de Garreta, S. G. de Castiglia, D. Feld, and A. E. A. Mitta. 1973, 12p
In Spanish. U.S. Sales Only.

Descriptors: (*Hands, *Radiation doses), Chemical preparation, Indium 113, Labelled compounds, Personnel dosimetry, Thermoluminescent dosemeters.

For abstract, see NSA 28 02, number 02882.

CONF-730503-4/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
METHODS OF ESTIMATING DOSE TO MAN FROM REGIONAL GROWTH OF NUCLEAR POWER.
K. E. Cowser, R. S. Booth, B. R. Fish, G. R. Siegel, and W. S. Snyder. 1973, 18p SM-172/41

Descriptors: (*Nuclear power plants, *Radioactive wastes), (*Human populations, *Radiation doses), A codes, Computer calculations, Computer codes, Data acquisition systems, Earth atmosphere, Ecosystems, Environment, External irradiation, Food chains, H codes, Health hazards, Internal irradiation, Man, Planning, Radioactive waste disposal, Radioactivity, Radionuclide migration, Site selection, Surface waters, Tennessee river, W codes, Waste management.

For abstract, see NSA 28 03, number 05525.

CONF-730603-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
MODEL FOR EXPOSURE TO A SEMI-INFINITE CLOUD OF A PHOTON EMITTER.
J. W. Poston, and W. S. Snyder. 1973, 15p

Descriptors: (*Man, *Radiation dose distributions), (*Photons, Radiation dose distributions), Computer calculations, Decay, Depth dose distributions, Energy spectra, Irradiation, Organs, Phantoms, Radioisotopes, Scattering.

For abstract, see NSA 28 03, number 05966.

COO-1024-48/GA PC$3.00/MF$1.45
Iowa Univ., Iowa City. Radiation Research Lab.
COMPARISON OF THE CYTOLOGICAL EFFECTS PRODUCED BY IONIZING RADIATIONS OF DIFFERENT LET. TECHNICAL PROGRESS REPORT, MARCH 1972--MARCH 1973.
E. F. Jr. Riley. 1973, 18p
Contract AT(11-1)-1024

Descriptors: (*Tritium, *Uptake), (*Chickens, *Radionuclide kinetics), (*Crystalline lens, *Biological radiation effects), Cornea, Epithelium, Labelled compounds, Rats, Thymidine, Embryos, Photon beams, Wounds, X radiation, Animal cells, Biological recovery, Fission neutrons.

For abstract, see NSA 28 02, number 02926.

COO-1602-34/GA PC$3.00/MF$1.45
Utah State Univ., Logan. Dept. Of Zoology.
EFFECTS OF X-IRRADIATION ON STEROID BIOTRANSFORMATIONS BY TESTICULAR TISSUES. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
L. C. Ellis. 11p
Contract AT(11-1)-1602

Descriptors: (*Testes, *Biological radiation effects), (*Androgens, *Biosynthesis), (*Testosterone, *Metabolism), Catalase, Dose-response relationships, Histology, Lipids, Melatonin, Photon beams, Pineal gland, Rats, Whole-body irradiation, X radiation.

For abstract, see NSA 28 03, number 06001.

COO-3007-23/GA PC$4.50/MF$1.45
Delaware Univ., Newark. Dept. Of Chemistry.
INTERACTION OF A BLUE--GREEN ALGAL HOST/VIRUS SYSTEM WITH IONIZING RADIATION.
M. P. Kraus. 1973, 48p

Descriptors: (*Algae, *Genetic radiation effects), (*Viruses, Genetic radiation effects), Biological radiation effects, Cell cultures, Gamma radiation, Genetics, Molecular biology, Photon beams, Radioresistance, Survival curves.

For abstract, see NSA 28 02, number 02841.

COO-3086-2/GA PC$3.00/MF$1.45
Rhode Island Univ., Kingston. Dept. Of Zoology.
EFFECTS OF IONIZING RADIATION ON SALAMANDER ORIENTATION. PROGRESS REPORT.
C. R. Shoop. 1 May 73, 9p
Contract AT(11-1)-3486

Descriptors: (*Salamanders, *Biological radiation effects), (*Frogs, Biological radiation effects), (*Amphibians, *Radionuclide kinetics), Behavior, Dna, Gamma radiation, Lethal radiation dose, Photon beams, Radioresistance, Cesium isotopes, Europium isotopes, Praseodymium isotopes, Reptiles, Sodium isotopes, Uptake, Isotope effects, Tantalum 182.

For abstract, see NSA 28 02, number 02927.

COO-3095-10/GA PC$4.25/MF$1.45
Albert Einstein Medical Center, Philadelphia, PA. Dept. Of Genetics.
ULTRAVIOLET LIGHT EFFECTS ON NUCLEIC ACID FORMATION AND GENETIC EVENTS IN BACTERIA. THREE YEAR COMPREHENSIVE REPORT.
C. O. Doudney. Apr 73, 42p
Contract AT(11-1)-3095

Descriptors: (*Escherichia coli, *Radiation injuries), (*Dna, *Biosynthesis), (*Chloramphenicol, *Radiosensitivity effects), (*Proteins, Biosynthesis), Biological radiation effects, Mutations, Photon beams, Radioinduction, Response modifying factors, Rna, Ultraviolet radiation.

For abstract, see NSA 28 03, number 05912.

COO-3264-7/GA PC$3.00/MF$1.45
Jackson Lab., Bar Harbor, Maine.
INBORN ANEMIAS IN MICE. COMPREHENSIVE PROGRESS REPORT, MAY 1, 1970--APRIL 30, 1973.
E. S. Russell, and S. E. Bernstein. 1 May 73, 8p
Contract AT(11-1)-3264

Descriptors: (*Anemias, *Biological radiation effects), (*Erythropoietin, Biological radiation effects), (*Blood formation, *Biological regeneration), (*Spleen, *Therapy), Anoxia, Mice, Mutants, Photon beams, Radiosensitivity, Stem cells, X radiation.

For abstract, see NSA 28 02, number 02929.

COO-3264-8/GA PC$3.25/MF$1.45
Jackson Lab., Bar Harbor, Maine.
INBORN ANEMIAS IN MICE. PROGRESS REPORT, MAY 1, 1972--APRIL 30, 1973.
E. S. Russell, and S. E. Bernstein. 1 May 73, 23p
Contract AT(11-1)-3264

Descriptors: (*Anemias, *Therapy), (*Spleen, *Biological radiation effects), Anoxia, Corticosteroids, Erythropoiesis, Lymphocytes, Mice, Photon beams, Radiosensitivity, Transplants, X radiation.

For abstract, see NSA 28 02, number 02928.

COO-3334-2/GA PC$4.25/MF$1.45
Massachusetts General Hospital, Boston.
THERMAL AND EPITHERMAL NEUTRONS IN THE TREATMENT OF NEOPLASMS. TECHNICAL PROGRESS REPORT, MAY 1, 1972--APRIL 30, 1973.
W. H. Sweet. 1 May 73, 43p
Contract AT(11-1)-3334

Descriptors: (*Neutron capture therapy, Boron compounds), (*Boron compounds, *Biological effects), Chemical preparation, Neoplasms, Radiotherapy, Rats, Testing.

For abstract, see NSA 28 03, number 07710.

COO-3419-6/GA PC$3.00/MF$1.45
Pennsylvania State Univ., University Park. Dept. Of Biophysics.
BIOLOGICAL AND CHEMICAL STUDIES ON PHYSICAL MUTAGENS. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
S. Person. 8p
Contract AT(11-1)-3419

Descriptors: (*Tritium, *Biological radiation effects), (*Mutations, *Radioinduction), (*Dna, *Strand breaks), Bacteria, Beta particles, Biological repair, Cytosine, Decay, In vitro, Pyrimidines, Tritium compounds.

For abstract, see NSA 28 02, number 02820.

FRNC-CONF-66/GA PC$3.00/MF$1.45
Clinique Rhumatologique, Nancy (France).
ELIMINATION OF EXP 224 RA INTRODUCED BY INTRA-ARTICULATORY INJECTION.
P. Louyot, Y. Laurent-Montet, A. Bertrand, J. Stines, and J. Pourel. 1971, 6p CONF-710563-5
In French. U.S. Sales Only.

Descriptors: (*Radium 224, *Excretion), (*Man, *Radionuclide kinetics), Bone joints, Feces, Injection, Radionuclide administration, Therapy, Urine.

For abstract, see NSA 28 02, number 02985.

FRNC-TH-299/GA PC$5.50/MF$1.45
Paris Univ., Orsay (France).
DOSIMETRY OF HIGH INTENSITY ELECTRON PULSES USING AQUEOUS OXALIC ACID SOLUTIONS: CALIBRATION USING AN ABSOLUTE ADIABATIC CALORIMETRY METHOD.
A. Melende. 1971, 69p
In French. U.S. Sales Only.

Descriptors: (*Chemical dosemeters, *Calibration), (*Electron dosimetry, Chemical dosemeters), Aqueous solutions, Calorimeters, G value, Mev range 01-10, Oxalic acid, Radiolysis.

For abstract, see NSA 28 02, number 02698.

IRS-W-5/GA PC$3.75/MF$1.45
Technischer Ueberwachungs-Verein E. V., Cologne (West Germany). Institut fuer Reaktorsicherheit.
PARAMETERS TO BE CONSIDERED WHEN CALCULATING THE AGE-DEPENDENT EXP 131 I DOSE TO THE THYROID.
F. O. Hoffman. Apr 73, 33p
U.S. Sales Only.

Descriptors: (*Iodine 131, *Retention), (*Thyroid, *Radiation dose distributions), (*Man, *Radionuclide kinetics), Age dependence, Biological half-life, Decay, Ingestion, Inhalation, Mass.

For abstract, see NSA 28 03, number 06063.

KFK-EXT-12/72-1/GA PC$4.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Strahlenbiologie.
PHYSICAL AND BIOLOGICAL PARAMETERS OF RADIOTHERAPY WITH MESONS, NEUTRONS, AND CHARGED PARTICLES: LET, RBE, OXYGEN EFFECT, AND DOSE FRACTIONATION.
H. Jung. Oct 72, 45p
In German. U.S. Sales Only.

Descriptors: (*Radiotherapy, Radiation sources), (*Radiation sources, *Comparative evaluations), Alpha particles, Charged particles, Depth dose distributions, Fractionated irradiation, Gamma radiation, Let, Neoplasms, Neutrons, Oxygen, Oxygen enhancement ratio, Photon beams, Pions minus, Protons, Rbe, X radiation.

For abstract, see NSA 28 02, number 02884.

NIRS-11/GA PC$7.00/MF$1.45
National Inst. Of Radiological Sciences, Chiba (Japan).
ANNUAL REPORT, 1971--1972.
Oct 72, 96p
U.S. Sales Only.

Descriptors: (*Japan, *Research programs), Environment, Medicine, Radiation monitoring, Radiation protection.

For abstract, see NSA 28 02, number 04971.

N73-27939/0GA PC$3.00/MF$1.45
Battelle-Northwest, Richland, Wash.
MEASUREMENT OF RADIATION EXPOSURE OF ASTRONAUTS BY RADIOCHEMICAL TECHNIQUES.
Quarterly Research Report, 2 Oct. - 31 Dec. 1972.
R. L. Brodzinski. 15 Jan 73, 20p NASA-CR-133378, BNWL-1183-13
Contract AT(45-1)-1830
Subm-Sponsored in Part by NASA.

Descriptors: *Astronauts, *Postflight analysis, *Radiation dosage, *Urinalysis, Aerospace medicine, Radioactive isotopes, Sodium isotopes.

For abstract, see STAR 1119

ORNL-TM-4154/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
CONTRIBUTION OF RADON IN NATURAL GAS TO THE NATURAL RADIOACTIVITY DOSE IN HOMES.
C. J. Barton, R. E. Moore, and P. S. Rohwer. Apr 73, 29p
Contract W-7405-eng-26

Descriptors: (*Natural gas, *Natural radioactivity), (*Human populations, *Radiation doses), Buildings, Combustion, Computer calculations, Daughter products, Epithelium, Heating, Inhalation, Radon, Respiratory system, Usa, Ventilation.

For abstract, see NSA 28 02, number 02973.

ORNL-TM-4166/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
USE OF PROTON BEAMS FOR RADIOTHERAPY: A SUMMER STUDY AT ORIC.
J. G. Jr. Castle, and R. B. Dickinson. Apr 73, 29p
Contract W-7405-eng-26

Descriptors: (*Radiotherapy, Proton beams), (*Proton beams, *Isodose curves), Mev range 10-100, Mev range 100-1000, Neoplasms, Spatial dose distributions.

For abstract, see NSA 28 02, number 02885.

ORNL-TM-4217/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
MEDICAL X-RAY DOSE ESTIMATION PROGRAM. PROGRESS REPORT FOR PERIOD ENDING FEBRUARY 28, 1973.
J. W. Poston, and G. G. Warner. Apr 73, 30p
Contract W-7405-eng-26

Descriptors: (*X radiation, *Radiation doses), (*Crystalline lens, Radiation doses), (*Thyroid, Radiation doses), (*Gonads, Radiation doses), Computer codes, Dosimetry, Kev range 10-100, Optimization, Phantoms, Photon beams.

For abstract, see NSA 28 03, number 07193.

ORO-2690-13/GA PC$5.25/MF$1.45
Florida State Univ., Tallahassee. Inst. Of Molecular Biophysics.
ANNUAL REPORT NO. 13, SEPTEMBER 1, 1972--AUGUST 31, 1973. PART B. TECHNICAL.
1 Jun 73, 65p
Contract AT(40-1)-2690

Descriptors: (*Molecular biology, *Research programs), Enzymes, Physiology, Beta decay, Radioisotopes, Infectivity, Nucleoproteins, Physical properties, Viruses, Indoles, Muscles.

For abstract, see NSA 28 03, number 05939.

ORO-3408-20/GA PC$3.00/MF$1.45
Texas Univ., Austin. Lab. Of Radiation Biology.
(PROGRESS REPORT ON PHYSICO-CHEMICAL STUDIES OF RADIATION EFFECTS IN CELLS).
E. L. Powers. 14 May 73, 14p
Contract AT(40-1)-3408

Descriptors: (*Bacterial spores, *Biological radiation effects), (*Chlorella, *Photosynthesis), Dose rates, Gases, Nitrogen oxides, Photon beams, Ultraviolet radiation, Uptake, Water.

For abstract, see NSA 28 03, number 05914.

PATENT-3 678 275/GA Not available NTIS
Department of the Air Force Washington D C
DOSIMETRY SYSTEM FOR MEASURING INSTANTANEOUS DOSE AND LINEAR ENERGY TRANSFER SPECTRUM OF SPACE RADIATIONS.
Patent,
Marion F. Schneider, and Edward L. Breen. Filed 15 Apr 71, patented 18 Jul 72, 14p Rept nos. PAT-APPL-134 280,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Dosimeters, *Patents), Space environmental conditions, Radiation hazards, Ionization chambers, Logic circuits, Manned spacecraft.
Identifiers: PAT-CL-250-83-6-R.

The patent describes a space radiation dosimetry system using a portable ionization chamber mountable in a housing containing associated electronics and a linear energy transfer (LET) spectrometer with associated electronics. The LET spectrometer uses a pair of solid state detectors in combination with amplifiers, a discretionary number of discriminator channels, logic circuits and counters to measure the linear energy transfer spectrum of high energy ionizing radiations.

RD/B/N-2539/GA PC$4.75/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
AUTOMATIC FILM BADGE READER USING A PROGRAMMABLE DESK CALCULATOR.
M. J. Hill, W. N. Walker, and D. F. Waring. Dec 72, 53p
U.S. Sales Only.

Descriptors: (*Photographic film dosemeters, *Readout systems), (*Neutron dosimetry, Photographic film dosemeters), (*Gamma dosimetry, Photographic film dosemeters), (*Beta dosimetry, Photographic film dosemeters), Automation, Personnel dosimetry, X-ray dosimetry.

For abstract, see NSA 28 02, number 02699.

RLO-2221-T-2-16/GA PC$3.75/MF$1.45
Washington State Univ., Pullman. Dept. Of Agronomy and Soils.
INCREASING THE EFFECTIVENESS, EFFICIENCY, AND SPECIFICITY OF MUTATION INDUCTION IN FLOWERING PLANTS.
R. A. Nilan. 1972, 35p
Contract AT(45-1)-2221

Descriptors: (*Mutations, *Radioinduction), (*Plants, Mutations), (*Mutagens, *Efficiency), Biological radiation effects, Crops, Fast neutrons, Gamma radiation, Ph value, Photon beams, Reviews, Temperature dependence, X radiation.

For abstract, see NSA 28 03, number 05940.

RLO-2221-T-2-20/GA PC$3.00/MF$1.45
Washington State Univ., Pullman.
STUDY OF FACTORS GOVERNING PLANT RADIOSENSITIVITY. ANNUAL PROGRESS REPORT, MAY 1, 1972--MAY 1, 1973.
R. A. Nilan, and C. F. Konzak. 1 May 73, 5p
Contract AT(45-1)-2221

Descriptors: (*Barley, *Biological radiation effects), (*Azides, *Radiosensitivity effects), (*Caffeine, Radiosensitivity effects), (*Peroxidases, Radiosensitivity effects), Chromosomal aberrations, Dna, Ethylene, Gamma radiation, Leaves, Mutations, Nitroso compounds, Photon beams, Radioinduction, Response modifying factors, Seeds, Sodium compounds, Sulfates, Urea, X radiation.

For abstract, see NSA 28 03, number 05941.

RLO-2225-T-16-9/GA PC$3.00/MF$1.45
Washington Univ., Seattle. School of Medicine.
LYMPHOCYTE FORMATION, LIFE SPAN, FATE, AND POTENTIAL FOR REPOPULATING HEMOPOIETIC TISSUES OF IRRADIATED ANIMALS. COMPREHENSIVE REPORT, APRIL 1, 1961--APRIL 4, 1973.
14p
Contract AT(45-1)-2225

Descriptors: (*Lymphocytes, *Blood formation), (*Blood cells, *Biological radiation effects), (*Erythropoiesis, *Polycythemia), Autoradiography, Biosynthesis, Gamma radiation, Immune serums, Parabiosis, Photon beams, Proteins, Rats, Thymidine, Tracer techniques, Tritium, Guinea pigs, Iron 55.

For abstract, see NSA 28 02, number 02930.

RLO-2227-T-12-36/GA PC$3.00/MF$1.45
Oregon State Univ., Corvallis (Usa). School of Oceanography.
TURNOVER OF EXP 65 ZN IN OYSTERS.
N. Cutshall. 1972, 19p

Descriptors: (*Oysters, *Radionuclide kinetics), (*Zinc 65, *Uptake), Equations, Pacific ocean.

For abstract, see NSA 28 03, number 06080.

RT/BIO-(72)20/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
BEHAVIOR AND TRANSMISSIBILITY OF RADIATION-INDUCED RING CHROMOSOMES.
F. Saccardo. 16 Sep 70, 16p CONF-700458-2
In Italian. U.S. Sales Only.

Descriptors: (*Pisum, Genome mutations), (*Genome mutations, *Radioinduction), (*Chromosomal aberrations, Radioinduction), Chimeras, Genetic radiation effects, Mitosis, Mutations, Photon beams, Pollen, Radioinduction, X radiation.

For abstract, see NSA 28 03, number 05942.

TID-26307/GA PC$8.25/MF$1.45
Tennessee Univ., Knoxville.
REPAIR OF ULTRAVIOLET LIGHT-INDUCED DAMAGE TO THE DNA IN WILD-TYPE AND ULTRAVIOLET-SENSITIVE STRAINS OF NEUROSPORA CRASSA.
T. E. Worthy. Dec 72, 122p

Descriptors: (*Dna, *Biological repair), (*Neurospora, *Biological radiation effects), (*Pyrimidines, *Labelling), Caffeine, Centrifugation, Chemical radiation effects, Cytosine, Deuterium compounds, Dimers, Mutants, Nitrogen 15, Phosphorus 32, Proflavine, Response modifying factors, Strand breaks, Tritium, Ultraviolet radiation, Uridine.

For abstract, see NSA 28 02, number 02822.

TID-26323/GA PC$5.25/MF$1.45
Pacific Gas and Electric CO., San Francisco, Calif.
EFFECTS OF IONIZING RADIATION ON THE TESTICULAR FUNCTION OF MAN. TEN YEAR PROGRESS REPORT.
M. J. Rowley. 30 Apr 73, 64p
Contract AT(45-1)-1780

Descriptors: (*Testes, *Biological radiation effects), Acute irradiation, Androgens, Animal cells, Biological repair, Biosynthesis, Cytology, Dose-response relationships, Latency period, Man, Morphological changes, Pathological changes, Radiation doses, Ultrastructural changes, X radiation.

For abstract, see NSA 28 02, number 02887.

UR-3490-170/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
NONIONIZING RADIANT ENERGY IN THE HEALING ARTS--PRODUCT EMISSION STANDARDS AND PERSONNEL EXPOSURE STANDARDS.
S. M. Michaelson, and W. M. Houk. 1972, 10p
CONF-721204-3

Descriptors: (*Medicine, *Diagnostic techniques), Biological effects, Electromagnetic radiations, Measuring instruments, Safety.

For abstract, see NSA 28 02, number 05077.

UR-3490-243/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
COMPARATIVE ASPECTS OF RADIOFREQUENCY AND MICROWAVE BIOMEDICAL RESEARCH. PRELIMINARY SUMMARY.
S. M. Michaelson, and H. P. Schwan. 1971, 10p
CONF-730609-1

Descriptors: (*Microwave radiation, *Biological effects), Animals, Health hazards, Research programs.

For abstract, see NSA 28 03, number 07824.

6S. Stress Physiology

AD-767 204/1GA PC$3.00/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
RELATION BETWEEN DAILY NOISE EXPOSURE AND HEARING LOSS BASED ON THE EVALUATION OF 6,835 INDUSTRIAL NOISE EXPOSURE CASES.
Final rept.,
William L. Baughn. Jun 73, 39p* Rept no. AMRL-TR-73-53
Prepared in cooperation with Environmental Protection Agency, rept. no. EPA-550-73-001-C. See also AD-767 205.

Descriptors: (*Noise, *Hearing), (*Industrial medicine, Noise), Thresholds(Physiology), Exposure, Audiometry, Deafness, Auditory acuity, Otorhinolaryngology.
Identifiers: *Noise pollution.

The study is designed to display the percent of a population exhibiting greater than certain specified audiometric hearing levels as a function of specified exposure levels and duration of exposures to those levels. Audiometric data from 6835 employees of an industrial plant were taken during the period from 1960 through 1965. The employees were selected only on the criterion that their noise exposures were reasonably well known. Hearing levels for each of three exposure conditons (78, 86, and 92 dBA) were obtained for the speech (0.5, 1, and 2 kHz) and the 4 kHz audiometric frequencies. The data are smoothed and hearing risk tables are presented. (Author)

AD-767 205/8GA PC$3.50/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
PREDICTION OF NIPTS DUE TO CONTINUOUS NOISE EXPOSURE.
Joint EPA/USAF Study,

Daniel L. Johnson. Jul 73, 67p* Rept no. AMRL-TR-731
Prepared in cooperation with Environmental Protection Agency, rept. no. EPA-550/9-73-001-B. See also AD-767 204.

Descriptors: (*Noise, Thresholds(Physiology)), (*Hearing, Noise), Audiometry, Exposure, Hazards, Deafness, Auditory acuity, Frequency.
Identifiers: *Hearing conservation, *Noise pollution.

The report compares the relationship of noise exposure to noise induced permanent threshold shift (NIPTS) as predicted by the currently available works of Passchier-Vermeer, Robinson, Baughn and Kryter, and the yet unpublished work of the National Institute of Occupational Safety and Health. The works of Passchier-Vermeer, Robinson, and Baughn are selected since these are the only works that completely predict the relationship between NIPTS and noise exposure for various audiometric frequencies, sound pressure levels and population percentiles. The predictions of these three methodologies are averaged in order to provide one single relationship between continuous noise exposure and NIPTS. This relationship is presented in various ways so that the effect of noise exposure on hearing can be viewed in more than one way. Discussion concerning the type of frequency weighting, the equal energy rule, and long duration exposures is also provided. (Modified author abstract)

AD-767 274/4GA PC$4.75/MF$1.45
Dayton Univ Ohio Research Inst
A BASIS FOR LIMITING NOISE EXPOSURE FOR HEARING CONVERSATION.
Final technical rept.,
J. C. Guignard. Jul 73, 159p* Rept no. UDRI-TR-73-29 AMRL-TR-73-90, EPA-550/9-73-001-A
Contract F33615-72-C-1402

Descriptors: (*Noise, *Hearing), (*Deafness, Noise), Audiometry, Auditory acuity, Experimental data, Physiology, Stress(Physiology).
Identifiers: *Hearing conversation.

A compilation of data is provided, with references to published work, which represents the present state of knowledge concerning the effects of continuous and impulsive noise on hearing. The danger to the ear of both occupational and nonoccupational human exposure to noise is considered. Data are included or cited which enable quantitative predictions to be made of the risk to hearing in the American population due to noise exposure in any working or living context. Recommendations are made concerning the need to obtain more definitive data. Relevant aspects of noise on the ear are discussed in appendices to the main report. The report deals solely with the effects of noise on hearing; other physiological or psychological effects of noise are not considered. (Author)

AD-767 319/7GA PC$4.50/MF$1.45
Naval Air Development Center Warminster Pa Crew Systems Dept
ANALYSIS OF HEAD IMPACT.
Interim rept.,
Stephen L. Gordon. 1 Apr 73, 135p Rept no. NADC-73065-40

Descriptors: (*Head, *Impact), Models(Simulations), Brain, Crash injuries, Elasticity, Tensile properties.
Identifiers: *Biomechanics, Biodynamics.

A finite difference form of the governing equations of motion for one and two-dimensional wave propagation is utilized to solve the problem of nonpenetrating impact to the human head. The layered plate one-dimensional analysis provides a method of predicting the influence of several material property and size modifications in a geometrically simplified head impact model. The spherical model with a layered energy absorbing skull yields highly attenuated and smoothed tensile pressure peaks in the brain as compared to the results with a single layered elastic skull. An elastic brain model (that includes an assumed high dynamic shear modulus) suggests that the combined shear-normal stress levels would be more likely to cause failure than the shear free stress condition in a hydrodynamic brain model. The generality of the solution techniques would readily permit extension of the analyses to investigate the significance of future modelling considerations. (Author)

BNWL-SA-4635/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
OBSERVED INCREASE IN THERMAL TOLERANCE OF FISH CAUSED BY INDUCED PIGMENT ADJUSTMENT.
R. M. Emery. Feb 73, 12p CONF-730505-1

Descriptors: (*Fishes, *Pigments), Color, Medium temperature, Sensitivity, Thermal radiation.

For abstract, see NSA 28 03, number 07669.

CEA-CONF-2207/GA PC$3.500/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
PERSPECTIVE IN TO ELECTRONYSTAGMOGRAPHY BY ELECTRONICS.
J. Max. 25 Aug 72, 28p CONF-720991-1
In French. U.S. Sales Only.

Descriptors: (*Electronic equipment, *Vestibular apparatus).

For abstract, see NSA 28 03, number 07673.

CEA-CONF-2208/GA PC$3.50/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
ELECTRONIC EQUIPMENT FOR ELECTRONYSTAGMOGRAPHY.
J. Max, A. Despringre, and C. Conraux. 1 Sep 72, 29p CONF-720991-2
In French. U.S. Sales Only.

Descriptors: (*Nervous system diseases, *Diagnostic techniques), Electronic equipment, Patients.

For abstract, see NSA 28 03, number 07674.

N73-27054/8GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
STIMULATION OF PANTING BY ISOLATED HEATING OF THE SPINAL COLUMN IN THE WAKE DOG.
C. Jessen. Jul 73, 25p NASA-TT-F-14998
Contract NASW-2481
Tran-Transl. Into English from Pfluegers Arch. (West Ger.), V. 297, 1967 p 53-70.

Descriptors: *Dogs, *Heating, *Respiratory rate, *Spinal cord, Ambient temperature, Biological effects, Stress (Physiology).

For abstract, see STAR 1118

N73-27058/9GA PC$3.00/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
AROUSAL FROM SLEEP BY NOISES FROM AIRCRAFT WITH AND WITHOUT ACOUSTICALLY TREATED NACELLES.
J. S. Lukas, D. J. Peeler, and M. E. Dobbs. Jul 73, 51p NASA-CR-2279
Contract NAS1-11243

Descriptors: *Aircraft noise, *Arousal, *Electroencephalography, *Human reactions, *Sleep, Nacelles, Noise intensity, Wakefulness.

For abstract, see STAR 1118

N73-27935/8GA PC$6.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
NOISE AND NOISE SICKNESS.
Y. T. Andreyevagalanina, S. V. Alekseyev, A. V. Kadyskin, and G. A. Suvopov. Jul 73, 339p
NASA-TT-F-748
Contract NASW-2035
Tran-Transl. Into English of the Publ. "Shum I Shumovaya Bolezn" Leningrad, Meditsina, 1972 304 p.

Descriptors: *Human tolerances, *Noise injuries, Acoustic fatigue, Central nervous system, Health physics, Hearing, Industrial safety.

For abstract, see STAR 1119

N73-27940/8GA PC$4.25/MF$1.45
Institut Franco-Allemand de Recherches, St. Louis (France).
INFLUENCE OF PRESSURE RISE TIME OF AN N SHOCK WAVE, SIMULATING THE SONIC BOOM ON THE COCHLEAR AND ACOUSTICALLY EVOKED POTENTIALS OF THE GUINEA PIG INFLUENCE DES TEMPS DE MONTEE EN PRESSION D'UNE ONDE EN N, SIMULANT LE BANG SONIQUE, SUR LES POTENTIELS COCHLEAIRES ET LES POTENTIELS EVOQUES AUDITIFS DU COBAYE.
A. Dancer, and R. Franke. 14 Sep 72, 45p ISL-31/72
Contract DRME-72/289
Language in French.

Descriptors: *Bioelectric potential, *Cochlea, *Psychoacoustics, *Time dependence, Auditory perception, Auditory stimuli, Guinea pigs, Sonic booms, Sound pressure, Time dependence.

For abstract, see STAR 1119

N73-27966/3GA PC$5.25/MF$1.45
Institut Franco-Allemand de Recherches, St. Louis (France).
DETERMINATION OF LESION THRESHOLD IN THE GUINEA PIG AUDITORY AREA DUE TO SONIC BOOM NIVEAU LESIONNEL DU BANG SONIQUE SUR L'APPAREIL AUDITIF DU COBAYE.
A. Dancer, R. Franke, G. Evrard, C. Zeller, and P. Massard. 22 Nov 72, 64p ISL-33/72
Contract DRME-72/289
Language in French.

Descriptors: *Guinea pigs, *Sonic booms, *Thresholds (Perception), Audiometry, Auditory defects, Auditory perception, Auditory sensation areas, Cochlea, Eardrums, Lesions, Middle ear.

For abstract, see STAR 1119

N73-28842/5GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
THE CONQUEST OF OUTER SPACE.
T. Gualiterotti. Aug 73, 12p NASA-TT-F-15019
Contract NASW-2485
Tran-Transl. Into English of an Unpublished Italian Article "La Conquista Dello Spazio Esterno" 1973 4 p.

Descriptors: *Astronaut performance, *Physiological factors, *U.s.s.r. space program, Gravitational effects, Motion sickness, Spacecraft environments.

For abstract, see STAR 1119

PATENT-3 744 794/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RESTRAINT SYSTEM FOR ERGOMETER.
Patent.
R. L. Gause, and R. A. Spier. Patented 10 Jul 73, 5p NASA-CASE-MFS-21046-1,
Misc-Filed 25 Jun. 1971.

Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Constraints, *Ergometers, *Exercise (Physiology), *Reduced gravity, Equipment specifications, Patents, Product development.

A restraint system for securing a person to an ergometer while exercising under zero gravity conditions or while operating the ergometer in earth environment in a position other than the upright position. A padded, form-fitting body belt fits around the operator's waist and suspenders are attached to the body belt. The body belt is secured to the ergometer forwardly and rearwardly of the ergometer seat by adjustable belts joined to the body belt and releasably hooked to the ergometer frame.

6T. Toxicology

AD-767 596/0GA PC$3.00/MF$1.45
Oregon State Univ Corvallis Science Research Inst
METABOLIC EFFECTS OF MONOMETHYL HYDRAZINE.
Final rept. 1 Jan 71-31 Dec 72,
F. N. Dost, D. E. Johnson, and C. H. Wang. Jun 73, 38p AMRL-TR-73-33
Contract F33615-71-C-1516

Descriptors: (*Hydrazine, *Toxicity), (*Metabolism, Hydrazine), (*Glycolysis, Hydrazine), Hyperglycemia, Carbohydrates, Blood chemistry, Antimetabolites, Biochemistry.
Identifiers: Carbohydrate metabolism, Hydrazine/methyl.

The pattern of utilization of glucose specifically labeled with 14C at various carbon atoms by animals under subacute Metabolic Effects of Monomethyl Hydrazine (MMH) intoxication indicates that MMH produces a profound depression of glycolytic metabolism, possibly associated with failure of insulin release. Functionally, the deficit appears to be located immediately prior to formation of triose phosphate, although assay of enzyme activity shows that pyruvate kinase is also severely inhibited. Blood glucose levels in intoxicated rats with adequate glucose available but low glycogen rise precipitously and remain high for as long as 12 hours. Similar but less extensive increase was induced in absolutely fasted rats. The observed metabolic defects respond to pyridoxine HCl and to insulin therapy. (Author)

AERE-R-6987/GA PC$3.25/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
LEAD IN HUMAN TISSUE: A LITERATURE SURVEY WITH PARTICULAR REFERENCE TO THE DETERMINATION OF LEAD IN HUMAN RIB.
J. S. Hislop, and A. Parker. Dec 71, 24p
U.S. Sales Only.

Descriptors: (*Bone tissues, *Lead), Distribution, Man, Tissues.

For abstract, see NSA 28 02, number 04996.

CEA-CONF-2101/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Pierrelatte (France).
CONTRIBUTION TO THE STUDY OF HEALTH PROBLEMS POSED BY LEAD. TEACHING OF INDUSTRIAL HYGIENE AND OF ENVIRONMENTAL CONTROL.
J. Chalabreysse, M. Archimbaud, F. Teulon, and C. Simeon. 15 Jul 72, 17p
In French. U.S. Sales Only.

Descriptors: (*Lead, *Toxicity), Biological effects, Environment, Human populations, Man.

For abstract, see NSA 28 02, number 05005.

ORNL-EMIC-2/GA PC$15.75/MF$1.45
Oak Ridge National Lab., Tenn.
CHEMICAL MUTAGENESIS. A SURVEY OF THE 1971 LITERATURE.
Jun 73, 273p

Descriptors: (*Mutagenesis, *Bibliographies), Indexes, Mutagens.

For abstract, see NSA 28 03, number 07753.

ORNL-4879/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
TOBACCO SMOKE RESEARCH PROGRAM PROGRESS REPORT.
M. R. Guerin, and P. Nettesheim. Apr 73, 166p
Contract W-7405-eng-26

Descriptors: (*Nicotiana, Smokes), (*Smokes, *Research programs), Bioassay, Chemistry, Inhalation.

For abstract, see NSA 28 02, number 05051.

UCRL-74573/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SMOKE HAZARDS AND THEIR MEASUREMENT. A RESEARCHER'S VIEWPOINT.
J. R. Gaskill. 8 Mar 73, 20p CONF-730329-1

Descriptors: (*Smokes, *Health hazards), (*Aerosols, Health hazards), Anoxia, Combustion, Economics, Fire hazards, Fires, Gaseous wastes, Human populations, Inhalation, Men, Mortality, Organic polymers, Residues, Toxicity, Ventilation, Wood.

For abstract, see NSA 28 03, number 07810.

7. CHEMISTRY

7A. Chemical Engineering

BNWL-SA-4476/GA PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
SYNERGISTIC ADDITIVES WHICH ENHANCE COPPER EXTRACTION WITH LIQUID ION EXCHANGERS.
R. H. Moore, and J. A. Partridge. Nov 72, 20p
CONF-721214-1

Descriptors: (*Copper, *Solvent extraction), Ion exchange materials, Synergism.

For abstract, see NSA 28 03, number 07667.

CONF-730513-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
HYPERFILTRATION (REVERSE OSMOSIS) OF KRAFT PULP MILL AND BLEACH PLANT WASTES.
J. S. Jr. Johnson, R. E. Minturn, and G. E. Moore. 1973, 9p

Descriptors: (*Waste processing, *Liquid wastes), Industrial plants, Osmosis, Paper, Slurries, Water, Wood.

For abstract, see NSA 28 03, number 07690.

CONF-730519-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
DYNAMICALLY FORMED MEMBRANES IN ULTRAFILTRATION AND HYPERFILTRATION OF EFFLUENTS.
J. S. Jr. Johnson. 1973, 16p

Descriptors: (*Membranes, *Filtration), Waste processing, Wastes.

For abstract, see NSA 28 03, number 07691.

EUR-4946/GA PC$3.50/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
DEPOSITION OF PYROLYTIC SILICON CARBIDE ON DISCS IN A FLUIDIZED BED.
E. Erben, and H. Hausner. Apr 73, 30p
U.S. Sales Only.

Descriptors: (*Silicon carbides, *Deposition), (*Graphite, *Vapor deposited coatings), Chemical composition, Crystals, Density, Fluidized bed, Microstructure, Pyrolysis, Temperature dependence.

For abstract, see NSA 28 02, number 03025.

KFK-1790/GA PC$3.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Radiochemie.
SIMPLE DETERMINATION OF CHLORINE IN ORGANIC MATERIALS AND IN LOADED ACTIVATED CHARCOAL WATER FILTERS BY NEUTRON ACTIVATION ANALYSIS.
H. Ruf, E. Gantner, and A. von Baeckmann. Mar 73, 14p
In German. U.S. Sales Only.

Descriptors: (*Chlorine, *Activation analysis), (*Biological materials, Activation analysis), (*Charcoal, Activation analysis), Activated carbon, Gamma spectroscopy, Neutron beams, Nondestructive analysis, Quantitative chemical analysis.

For abstract, see NSA 28 03, number 05100.

KY-647/GA PC$4.00/MF$1.45
Paducah Gaseous Diffusion Plant, Ky.
REDUCTION OF HEXAVALENT CHROMIUM IN PADUCAH PLANT COOLANT WATER WITH SULFUR DIOXIDE.
G. T. Cook, and R. E. Simmons. 4 Apr 73, 13p
Contract W-7405-eng-26

Descriptors: (*Chromium compounds, *Reduction), (*Paducah plant, *Coolants), Cations, Chemical reactions, Efficiency, Ph value, Sulfur oxides, Temperature dependence, Water.

For abstract, see NSA 28 03, number 07729.

ORNL-TM-4112/GA PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn.
ELECTROLYTIC DEMONSTRATION UNIT FOR COPPER REMOVAL FROM DISTILLATION PLANT BLOWDOWN.
F. A. Posey. Mar 73, 41p
Contract W-7405-eng-26

Descriptors: (*Copper, *Separation processes), Distillation, Electrolysis, Liquid wastes, Water.

For abstract, see NSA 28 03, number 07756.

ORNL-tr-2568/GA PC$3.75/MF$1.45
SPONTANEOUS IGNITION OF CARBON AS A PROCESS PROBLEM CONTRIBUTION TO THE OPERATING SAFETY OF SOLVENT RECOVERY INSTALLATIONS.
K. Bratzler. 1972, 30p
Translated by R.G. Mansfield (Oak Ridge National Lab., TN), from a German paper.

Descriptors: (*Solvent extraction, *Fire hazards), Carbon, Combustion, Safety engineering.

For abstract, see NSA 28 03, number 07758.

PATENT-3 694 321/GA Not available NTIS
Office of the Secretary of the Army Washington D C
PORTABLE DISTILLATION UNIT.
Patent,

Frank A. Marovich, Jean Bordeaux, and Donald W. Sawtelle. Filed 3 Nov 70, patented 26 Sep 72, 7p Rept nos. PAT-APPL-86 579,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Distillation), (*Distillation, Portable), (*Water, *Sterilization), Pyrogens, Liquid filters, Ion exchange resins.
Identifiers: *Distillation equipment, PAT-CL-202-83, Water treatment.

The patent describes a portable stainless steel water distillation unit capable of producing sterile, pyrogen-free water in a single distillation. A filtering section permits the use of deionizing resin or activated charcoal. A series of baffles permit the incoming water to be preheated by a portion of the steam. Another series of baffles filter out particulate matters from the steam on its way to the condensation chamber where it is effectively cooled but isolated from the feed water. The relationship of the elements enables the compact, durable unit to function at maximum thermal efficiency.

PB-223 449/0GA PC$3.00/MF$1.45
Research Triangle Inst., Durham, N.C.
THE REMOVAL OF TOXIC METALS FROM WATER BY REVERSE OSMOSIS.
Research and development progress rept.,
F. O. Mixon. Sep 73, 50p* Int-OSW-RDPR-73-889
Contract DI-14-30-3064

Descriptors: (*Osmosis, *Trace elements), (*Membranes, Osmosis), (*Cellulose acetate, Membranes), (*Polyamide resins, Membranes), (*Water treatment, Trace elements), Lead(Metal), Barium, Cadmium, Zinc, Copper, Chromium, Water pollution, Brackish water, Metals, Potable water, Performance evaluation, Toxicity, Desalting.
Identifiers: Reverse osmosis desalination.

Experimental bench scale studies were carried out with cellulose acetate and polyamide reverse osmosis membranes to establish rejection efficiencies for different metallic contaminants including barium, cadmium, zinc, copper, chromium and lead. These tests were conducted with trace levels of these metallic contaminants, singly and in combination and at different concentrations, while desalting potable water, various wastewaters and brackish waters. Except for copper in wastewater, metallic removal efficiencies of about 90% or greater were experienced. It was concluded that reverse osmosis may be effectively applied in the production of potable water where the raw water contains trace amounts of the various metals considered in this study. Reverse osmosis may also prove useful where sewage treatment plant effluent has residual trace metal content. (Author)

PB-223 579/4GA PC$7.75/MF$1.45
Babcock and Wilcox Co., Alliance, Ohio. Research Center.
EQUIMOLAR NO-NO2 ABSORPTION INTO MAGNESIA SLURRY: A PILOT FEASIBILITY STUDY,
W. Downs. 29 Nov 71, 115p BW-4653 EPA-650-2-73-015
Contract EPA-68-02-0022

Descriptors: (*Nitrogen oxides, Absorption), (*Magnesium oxides, *Absorbers(Equipment)), (*Air pollution control equipment, Nitrogen oxides), Scrubbers, Pilot plants, Nitrogen oxide(NO), Nitrogen oxide(N2O), Flue gases, Feasibility, Flow rate, Sulfur dioxide.
Identifiers: *Magnesium oxide scrubbing, Wet methods.

The purpose was to investigate the feasibility of absorption of equimolar concentrations of NOx into MgO slurry on a 1500 cfm wet scrubbing pilot plant. A wet scrubbing pilot plant consisting of several scrubbers was modified by the inclusion of an additional scrubber to enable series scrubbing of fly ash, sulfur dioxide, and finally nitrogen oxides. Gaseous nitrogen dioxide was injected into the flue gas following the SO2 scrubber but before the NOx scrubber. Seventeen tests were performed to evaluate parameters including the liquid-to-gas ratio, the ratio of NO2 to NO, slurry concentration, stoichiometry, and gas flow rate. NOx absorption was very poor for all conditions tested. The results are obscured by large variance in the NOx measuring techniques. SO2 absorption in the NOx scrubber was dependent upon the liquid-to-gas ratio and varied from 86% to 98.3%. Deposition on the underside of the first tray of the SO2 scrubber was observed. NOx absorption with equimolar concentrations of NO and NO2 into MgO slurry is not feasible in the apparatus tested. It is probably unfeasible in any practical gas-slurry contacting apparatus. NOx absorption into soluble alkalis may be feasible and would best be done in packed towers. (Modified author abstract)

PB-223 582/8GA PC$4.25/MF$1.45
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
THE WRIGHTSVILLE BEACH, NORTH CAROLINA, PILOT PLANT TESTING PROGRAM TO EVALUATE SEA WATER PRETREATMENT METHODS FOR REVERSE OSMOSIS PLANTS.
Research and development progress rept.
Sep 73, 122p* Int-OSW-RDPR-73-891
Contract DI-14-30-2833

Descriptors: (*Feedwater treatment, *Desalting), (*Chlorination, Feedwater treatment), (*Sand filtration, Feedwater treatment), (*Activated carbon treatment, Feedwater treatment), (*Ion exchanging, Feedwater treatment), pH, Coagulation, Turbidity, Iron, Chlorine, Biochemical oxygen demand, Performance evaluation, Osmosis, Membranes, Fouling, Fouling prevention, Sea water, Manganese.
Identifiers: Reverse osmosis desalination, Wrightsville Beach desalination plant.

A pilot plant investigation at the OSW (Office of Saline Water) Wrightsville Beach test facility evaluated the effectiveness of five pretreatment systems in improving the quality of sea water prior to reverse osmosis. Two identical filtration trains provided data for the following pretreatment systems: chlorination; rapid sand; manganese zeolite; and activated charcoal filtration. (Modified author abstract)

PB-223 594/3GA PC$4.25/MF$1.45
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
THE CHULA VISTA, CALIFORNIA, PILOT PLANT TESTING PROGRAM TO EVALUATE SEAWATER PRETREATMENT METHODS FOR REVERSE OSMOSIS.
Research and development progress rept.
Sep 73, 118p Int-OSW-RDPR-73-890
Contract DI-14-30-2833

Descriptors: (*Feedwater treatment, *Desalting), (*Osmosis, Desalting), (*Membranes, *Fouling prevention), Fouling, Coagulation, Chlorination, pH control, Alums, Clarification, Settling, Ion exchanging, Activated carbon treatment, Pressure filtration, Performance evaluation, Pilot plants, Water quality, Turbidity, Sea water, Sand filtration.
Identifiers: Reverse osmosis desalination, Hydraulic loading.

This study investigated sea water pretreatment methods which could be used in conjunction with reverse osmosis desalination to prolong membrane effectiveness. The investigation consisted of: (1) Bench-scale tests to determine optimum application of coagulants, chlorine and possible need for pH adjustments; (2) Pilot plant test to determine the effect of hydraulic loading; (3) Pilot plant test to determine the effects of chlorination, alum coagulation, settling, sand, manganese-zeolite, granular activated carbon and diatomaceous earth pressure filters; and (4) a two-week continuous run to determine the performance of the above mentioned filters under prolonged operation. The study showed that chlorination, sand pressure filtration and activated carbon filtration were sufficient to obtain the desired water quality of less than 1 JTU turbidity at all times during the test period. The bench-scale tests indicated that alum coagulation and settling provide satisfactory clarification. (Author)

PB-223 653/7GA PC$3.00/MF$1.45
International Materials Corp., Burlington, Mass.
LIMITED OIL GASIFICATION EXPERIMENT.
Final rept.,
Harold P. Sorensen. Jun 73, 44p EPA-R2-73-272
Contract EPA-68-02-0296

Descriptors: (*Fuel oil, *Gasification), (*Residual oils, Gasification), Pyrolysis, Hydrocarbons, Recombination reactions, Performance evaluation, Manufactured gas.
Identifiers: Sulfur containing fuels, *Reforming(Chemistry).

The report documents the results of a limited oil gasification program to experimentally investigate the feasibility of using International Materials Corporation's Segas system for processing No. 2 and 4 fuel oils and No. 6 high-sulfur residual oil. Existing hardware, originally designed to operate on gasoline for automotive applications, was modified for these tests. The process consists of a high-temperature petrochemical reaction in which a liquid hydrocarbon is thermally decomposed and then reformed to a synthesis gas in the presence of high-temperature steam. Although all tests were not completed, sufficient results obtained to indicate that the process is capable of stable sustained operation. (Modified author abstract)

PB-223 702/2GA PC$6.75/MF$1.45
Amicon Corp., Lexington, Mass.
EVALUATION OF ANISOTROPIC, IONOGENIC MEMBRANES (DIAFLO(TRADEMARK) UM-SERIES) FOR SELECTIVE REMOVAL OF DIVALENT CATIONS AND ANIONS FROM BRACKISH WATER BY REVERSE OSMOSIS.
Research and development progress rept.,
H. Shathmann, R. A. Cross, T. R. Rich, and B. E. Carroll. Oct 73, 94p INT-OSW-RDPR-73-894
Contract DI-14-30-2640

Descriptors: (*Desalting, Osmosis), (*Osmosis, Membranes), Polyelectrolytes, Performance evaluation, Cost estimates, Brackish water, Sea water, Ammonium compounds, Sulfonates.
Identifiers: *Reverse osmosis desalination.

A series of asymmetric membranes made from a polyelectrolyte complex resin has been evaluated by reverse osmosis tests for the selective removal of divalent ions from brackish waters. Three different types of membranes were studied. All three membranes were made from the same basic polymer, i.e., the reaction adduct of polyanion (polysodium styrene sulfonate) and a Polycation (polyvinyl benzyltrimethylammonium chloride). During first phase of study, the membrane was tested over short time periods with single salt solutions. The second phase consisted of long term tests (ca. 1000 hrs.) to evaluate membrane compaction and fouling using brackish and sea water feeds. The product flux of all three membranes increased linearly with applied hydrostatic pressure up to 600 psig. The average flux increase per 100 psi pressure difference is about 200 gfd. Long term evaluation indicated that compaction was of the same order of magnitude as that observed with cellulose acetate membranes. The rejection of monovalent and divalent ions did not change significantly with time.

PB-223 762/6GA PC$6.50/MF$1.45
Monsanto Research Corp., Durham, N.C.

DESIGN, CONSTRUCTION, AND FIELD TEST EVALUATION OF A HOLLOW FINE FIBER MODULE.
Research and development progress rept.,
T. A. Orofino, R. L. Leonard, J. C. Berry, T. E. Britt, and J. A. Carden. Oct 73, 87p Int-OSW-RDPR-73-893
Contract DI-14-30-2773

Descriptors: (*Desalting, Osmosis), (*Osmosis, Membranes), (*Membranes, Performance evaluation), Pilot plants, Radial flow, Axial flow, Economic analysis, Fabrication, Design, Brackish water, Flux(Rate).
Identifiers: Reverse osmosis desalination, *Hollow fiber membranes.

A nominal 20,000 gpd hollow fiber module of single-cartridge, radial flow design was constructed and field-tested for three months. Preparatory work included detailed engineering and economic evaluation of two alternate, axial flow modules also of nominal 20,000 gpd productivity, and fabrication of an instrumented test loop to accommodate the unit finally built. The module showed good flux stability throughout the test period, exceeding target performance with regard to module output and volumetric efficiency. Salt rejection stabilized at 85% for the remainder of the test. Average performance is reported. (Modified author abstract)

7B. Inorganic Chemistry

AD-767 068/0GA PC$3.00/MF$1.45
Martin Marietta Labs Baltimore Md
SURFACE CHARGE-DEPENDENT MECHANICAL BEHAVIOR OF NON-METALS.
Technical rept. no. 8,
N. H. Macmillan, and A. R. C. Westwood. Sep 73, 37p Rept no. MML-TR-73-13c
Contract N00014-70-C-0330

Descriptors: (*Crystals, Hardness), (*Hardness, Electrical properties), (*Dislocations, Mobility), Solids, Machining, Static electricity, Mechanical properties, Surface properties, Glass, Ceramic materials, Magnesium compounds, Oxides, Chemisorption, Non-metals.
Identifiers: Zeta potential, Magnesium oxides.

When an inorganic nonmetallic solid is immersed in a non-corrosion, surface-active liquid environment, the mobility of near-surface dislocations and/or microhardness is markedly influenced by the surface charge developed on the solid. Specifically, it appears that such solids are hardest at their iso-electric points (as determined from zeta-potential measurements). This paper presents some examples of such behavior, considers possible mechanisms, and discusses how such chemomechanical effects can be employed to control the machining and frictional behavior of ceramics and glasses. (Author)

AD-767 504/4GA Reprint
Florida Univ Gainesville Dept of Chemistry
ESR SPECTRUM AND STRUCTURE OF THE MAGNESIUM HYDROXIDE RADICAL,
Joseph M. Brom, Jr., and William Weltner, Jr. 13 Feb 73, 11p AFOSR-TR-73-1734
Grant AF-AFOSR-2208-72
Availability: Pub. in Jnl. of Chemical Physics, v58 n12 p5322-5330, 15 Jun 73.

Descriptors: (*Magnesium compounds, *Electron spin resonance), (*Hydroxides, Electron spin resonance), Hyperfine structure, Molecular structure, Spectra(Visible + ultraviolet), Free radicals.
Identifiers: Matrix isolation techniques, *Magnesium hydroxides, Magnesium inorganic compounds, Magnesium isotopes.

The MgOH molecule has been trapped in solid argon and neon at 4K, and its ESR spectrum measured. It has been isolated in these matrices by (1) codepositing Mg atoms with a matrix gas containing 1% H2O2, (2) codepositing Mg atoms with matrix gas and the products of a microwave discharge of H2O vapor, or (3) passing the metal atoms, along with H2O vapor, through a tantalum cell at 1700C before quenching in the matrix gas. Tensors and nuclear hyperfine components for interaction with 25Mg and H were determined. In both argon and neon these magnetic tensors appear to have axial symmetry, indicating that the molecule is probably linear. Spin density distribution derived from hyperfine splittings places a majority of the spin on Mg and implies that the molecule is highly ionic. A CNDO calculation slightly favors a linear structure and supports the observed spin distribution. Trapped Mg(+) and probably MgO2H were also observed in the ESR spectra. The large excess of Mg atoms in the matrices dominated the optical absorption spectrum in the ultraviolet. (Modified author abstract)

COM-73-50772/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
LEAD SEPARATION BY ANODIC DEPOSITION AND ISOTOPE RATIO MASS SPECTROMETRY OF MICROGRAM AND SMALLER SAMPLES.
Final rept.,
I. L. Barnes, T. J. Murphy, J. W. Gramlich, and W. R. Shields. 1973, 4p
Pub. in Analytical Chemistry, v45 n11 p1881-1884 Sep 73.

Descriptors: (*Lead(Metal), *Electrodeposition), (*Lead isotopes, *Isotope separation), Mass spectroscopy, Anodes, Microanalysis, Lead oxides, Performance evaluation.

A method is reported for the separation by anodic deposition and subsequent analyses by isotope ratio mass spectrometry of small samples of lead from a variety of matrices. The combined procedure is applicable to samples containing from 10 micrograms to less then 10 ng of lead and the electrodeposition is more than 95% efficient at these levels. Only a few elements interfere with the deposition, most notably iron and cerium, and procedures for removing the interfering elements are given. The optimum conditions for the anodic deposition of lead as PbO2 were studied. The mass spectrometric procedure described permits a precision of 0.1% (95% limit of error) or better for the measured isotopic ratios.

CONF-721010-43/GA PC$3.00/MF$1.45
Philips Gloeilampenfabrieken N. V., Eindhoven (Netherlands).
DETERMINATION OF RARE EARTHS IN YTTRIUM OXIDE BY MEANS OF A PRECONCENTRATION TECHNIQUE AND GE(LI)-GAMMA SPECTROMETRY.
P. C. M. N. Bruijs. 1972, 11p

Descriptors: (*Rare earths, *Activation analysis), (*Yttrium oxides, Activation analysis), Calibration standards, Coprecipitation, Gamma spectroscopy, Ion exchange chromatography, Iron, Multi-element separation, Neutron beams, Quantitative chemical analysis, Thermal neutrons.

For abstract, see NSA 28 02, number 02094.

CONF-721010-64/GA PC$3.00/MF$1.45
Ghent Rijksuniversiteit (Belgium). Institutt voor Kernwetenschappen.
HIGH PRECISION NEUTRON ACTIVATION ANALYSIS OF MANGANESE IN ORES AND ALLOYS WITH THE AID OF AN ISOTOPIC NEUTRON SOURCE.
L. Alaerts, J. P. Op de Beeck, and J. Hoste. 1972, 19p
U.S. Sales Only.

Descriptors: (*Manganese, *Activation analysis), (*Manganese alloys, Activation analysis), (*Ores, Activation analysis), Accuracy, Attenuation, Calibration standards, Counting techniques, Gamma detection, Interfering elements, Neutron beams, Neutron sources, Quantitative chemical analysis, Sample preparation, Self-shielding.

For abstract, see NSA 28 02, number 02095.

CONF-721010-69/GA PC$3.00/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
USE AND AUTOMATION OF MULTIELEMENT SUBSTOICHIOMETRIC EXTRACTION OF METAL CHELATES IN ACTIVATION ANALYSIS.
A. Elek. 1972, 11p
U.S. Sales Only.

Descriptors: (*Mercury, *Activation analysis), (*Silver, Activation analysis), (*Copper, Activation analysis), (*Antimony, Activation analysis), Accuracy, Automation, Chelates, Dithizone, Multi-element separation, Quantitative chemical analysis, Sensitivity, Solvent extraction, Substoichiometry, Arsenic, Dedtc.

For abstract, see NSA 28 02, number 02100.

CONF-721010-82/GA PC$3.00/MF$1.45
Hahn-Meitner-Institut fuer Kernforschung, Berlin (West Germany).
APPLICATION OF NEUTRON ACTIVATION ANALYSIS TO THE MEASUREMENT OF ISOTOPE ABUNDANCE SHIFTS IN CALCIUM AND POTASSIUM.
P. Moeller, and C. S. Sastri. 1972, 9p
U.S. Sales Only.

Descriptors: (*Calcium, *Isotope ratio), (*Potassium, Isotope ratio), (*Calcium 44, *Activation analysis), (*Potassium 41, Activation analysis), Accuracy, Errors, Geochemistry, Interfering elements, Irradiation procedures, Neutron beams, Quantitative chemical analysis, Sensitivity.

For abstract, see NSA 28 02, number 02111.

CONF-721010-85/GA PC$3.00/MF$1.45
DETERMINATION OF SMALL QUANTITIES OF NOBLE METALS BY ACTIVATION ANALYSIS.
Eh. E. Rakovskii, G. M. Baevskaya, T. D. Krylova, V. M. Kuligin, and M. I. Starozhitskaya. 1972, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Platinum, *Activation analysis), (*Palladium, Activation analysis), (*Iridium, Activation analysis), (*Osmium, Activation analysis), Multi-element separation, Neutron beams, Quantitative chemical analysis, Solvent extraction.

For abstract, see NSA 28 02, number 02114.

CONF-730613-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
PRESERVATION OF DILUTE MERCURY SOLUTIONS.
C. Feldman. 1971, 12p

Descriptors: (*Mercury, *Aqueous solutions), Containers, Permeability, Polyethylenes, Storage.

For abstract, see NSA 28 03, number 07692.

INR-1430/GA PC$3.50/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
PHYSICO-CHEMICAL PROPERTIES OF THE LANTHANIDE COMPLEXES WITH THENOYLTRIFLUOROACETONE. III. INFRA-RED SPECTRA OF THE LANTHANIDE COMPLEXES WITH TTA IN THE REGION FROM 1700 TO 400 CM- EXP 1 .
S. Lis. 1972, 26p
U.S. Sales Only.

Descriptors: (*Neodymium complexes, *Infrared spectra), (*Gadolinium complexes, Infrared spectra), (*Lutetium complexes, Infrared spectra), Tta.

For abstract, see NSA 28 02, number 02273.

IS-T-569/GA PC$5.00/MF$1.45
Ames Lab., Iowa.
POLARIZED CRYSTAL ABSORPTION SPECTRA FOR DIBROMO(ETHYLENEDIAMINE)PLATINUM(II).
R. F. Kroening. Feb 73, 60p
Contract W-7405-eng-82

Descriptors: (*Platinum complexes, *Absorption spectra), Carboxylic acids, Organic bromine compounds.

For abstract, see NSA 28 03, number 07718.

JEN-255/GA PC$3.75/MF$1.45
Junta de Energia Nuclear, Madrid (Spain). Division de Quimica.
DETERMINATION OF CARBON IN URANIUM AND ITS COMPOUNDS.
M. Perez Garcia. 1972, 33p
In Spanish. U.S. Sales Only.

Descriptors: (*Carbon, *Chemical analysis), (*Uranium, Chemical analysis), (*Uranates, Chemical analysis), (*Uranium oxides, Chemical analysis), Combustion, Phthalates, Potassium compounds, Quantitative chemical analysis, Titration, Uranium carbides, Uranium fluorides.

For abstract, see NSA 28 03, number 05140.

JINR-E12-6773/GA PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
CORRELATION BETWEEN THE OVERALL STABILITY CONSTANTS OF METAL COMPLEXES. II. APPLICATION TO DATA OBTAINED BY THE POLAROGRAPHIC METHOD FOR METAL-INORGANIC LIGAND SYSTEMS.
M. H. Mihailov, V. Ts. Mihailova, and V. A. Khalkin. 1972, 16p
U.S. Sales Only.

Descriptors: (*Cadmium compounds, *Stability), (*Lead compounds, Stability), (*Cadmium iodides, Stability), (*Rhodium chlorides, Stability), Complexes, Polarography, Thiocyanates.

For abstract, see NSA 28 03, number 07723.

JINR-E12-6775/GA PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
CORRELATION BETWEEN THE OVERALL STABILITY CONSTANTS OF METAL COMPLEXES. IV. COPPER-METHOXYACETATE, COPPER-ETHOXYACETATE, COPPER-THIODIACETATE, CADMIUM-ETHOXYACETATE, AND CADMIUM-(ETHYLTHIO)ACETATE SYSTEMS.
M. H. Mihailov, V. Ts. Mihailova, and V. A. Khalkin. 1972, 15p
U.S. Sales Only.

Descriptors: (*Copper complexes, *Stability), (*Cadmium complexes, Stability), Carboxylic acid salts, Organic oxygen compounds, Organic sulfur compounds.

For abstract, see NSA 28 03, number 07724.

JINR-E12-6776/GA PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
CORRELATION BETWEEN THE OVERALL STABILITY CONSTANTS OF METAL COMPLEXES. V. NICKEL--ETHOXYACETATE, NICKEL--(ETHYLTHIO)ACETATE AND LEAD--ETHOXYACETATE SYSTEMS.
M. H. Mihailov, V. Ts. Mihailova, and V. A. Khalkin. 1972, 17p
U.S. Sales Only.

Descriptors: (*Lead complexes, *Stability), (*Nickel complexes, Stability), Carboxylic acid salts, Organic oxygen compounds, Organic sulfur compounds.

For abstract, see NSA 28 03, number 07725.

KFK-1703/GA PC$3.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Radiochemie.
DETERMINATION OF URANIUM IN AQUEOUS SOLUTIONS BY MEANS OF GAMMA -ABSORPTIOMETRY.
O. Cristallini, E. Gantner, and A. von Baeckmann. Nov 72, 27p
In German. U.S. Sales Only.

Descriptors: (*Uranium, *Absorption spectroscopy), (*Aluminium nitrates, *Chemical analysis), Aqueous solutions, Gamma spectra, Nitric acid, Quantitative chemical analysis.

For abstract, see NSA 28 02, number 02211.

KFK-1726/GA PC$3.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
TERNARY CARBIDES AND NITRIDES OF THE ACTINIDES AND LANTHANIDES WITH OTHER TRANSITION METALS.
H. Holleck. Dec 72, 29p CONF-711075-1
In German. U.S. Sales Only.

Descriptors: (*Carbides, *Chemical reactions), (*Actinide compounds, Chemical reactions), (*Rare earth compounds, Chemical reactions), (*Transition element compounds, Chemical reactions), Burnup, Nitrides, Physical radiation effects, Sample preparation, Ternary alloy systems.

For abstract, see NSA 28 02, number 03027.

KFK-1767/GA PC$3.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Radiochemie.
DETERMINATION OF RARE EARTHS IN STANDARDIZED GLASSES BY MEANS OF NEUTRON ACTIVATION ANALYSIS.
H. Ruf. Feb 73, 24p
In German. U.S. Sales Only.

Descriptors: (*Rare earths, *Activation analysis), (*Glass, Activation analysis), Calibration standards, Ion exchange, Microanalysis, Neutron beams, Quantitative chemical analysis, Radiochemistry, Separation processes.

For abstract, see NSA 28 02, number 02123.

KY-648/GA PC$4.00/MF$1.45
Paducah Gaseous Diffusion Plant, Ky.
DETERMINATION OF NITROGEN IN URANIUM HEXAFLUORIDE.
S. C. Morgan, and R. E. Simmons. 18 Apr 73, 12p
Contract W-7405-eng-26

Descriptors: (*Nitrogen, *Chemical analysis), (*Uranium hexafluoride, Chemical analysis), Accuracy, Ammonia, Distillation, Quantitative chemical analysis, Sensitivity, Spectrophotometry, Titration.

For abstract, see NSA 28 03, number 05141.

LBL-1408/GA PC$4.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
REACTIONS OF HYDROGEN IN LIQUID AMMONIA SYSTEMS.
K. A. Strom. Nov 72, 50p
Contract W-7405-eng-48

Descriptors: (*Hydrogen, *Chemical reactions), (*Ammonia, Hydrogen), Hydrides, Hydrogenation, Iron complexes, Amides, Complexes, Copper compounds, Iridium complexes.

For abstract, see NSA 28 03, number 07738.

NP-19673/GA PC$4.00/MF$1.45
Atomic Energy Commission, Baghdad (Iraq). Nuclear Research Inst.
COORDINATION ABILITIES OF SOME HETEROCYCLIC N-BASES AND N-OXIDES TOWARDS VANADYLBIS(2,4-PENTANEDIONATO) COMPLEXES.
N. S. Al-Niaimi, A. R. Al-Karaghouli, and S. M. Aliwi. Sep 72, 11p
U.S. Sales Only.

Descriptors: (*Vanadium complexes, *Chemical preparation), Coordination valences, Heterocyclic compounds, Organic nitrogen compounds, Organic oxygen compounds.

For abstract, see NSA 28 03, number 07745.

PATENT-3 674 455/GA Not available NTIS
Department of the Air Force Washington D C
PROCESS FOR THE SYNTHESIS OF GLASS AND SINGLE CRYSTAL GERMANATES OF IDENTICAL COMPOSITION.
Patent,
Cortland O. Dugger. Filed 31 Jul 70, patented 4 Jul 72, 3p Rept nos. PAT-APPL-60 140,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Germanium compounds, *Glass), (*Patents, Germanium compounds), Oxides, Sodium compounds, Crystals, Synthesis(Chemistry).
Identifiers: PAT-CL-65-134, *Germanates.

The patent describes a method for growing high quality germanate glass and single crystalline materials of identical composition. In the starting component mixture the oxygen to germanium concentration ratio limits are 2.0:1 < or = O:Ge < or = 3.0:1. The reactant mixture is comprised of germanium oxide and sodium oxide.

PATENT-3 755 106/GA Not available NTIS
Department of the Interior, Washington, D.C.
ELECTROLYTIC OXIDATION OF SB2S3.
Patent,
Bernard J. Scheiner, Roald E. Lindstrom, and Thomas A. Henrie. Filed 15 May 72, patented 28 Aug 73, 2p PAT-APPL-232 606, DOCKET/MIN-1855
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Antimony inorganic compounds), (*Antimony inorganic compounds, *Oxidation), (*Electrolysis, Antimony inorganic compounds), Inorganic sulfides, Antimony oxides, Chemical reactions, Brines, Slurrying.
Identifiers: PAT-CL-204-96, *Antimony sulfides.

The patent describes the conversion of Sb2S3 to Sb2O5 by electrolysis of a slurry of sulfide in an aqueous solution containing alkali metal chloride, alkali metal bromide, or a mixture of the two.

SC-DC-72-1494/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
THERMAL DECOMPOSITION OF ZINC CHROMATES.
R. P. Clark, and F. W. Reinhardt. 1973, 28p

Descriptors: (*Chromium oxides, *Pyrolysis), (*Zinc oxides, Pyrolysis), Air, Chemical analysis, Emission spectroscopy, Sample preparation, Thermal gravimetric analysis, X-ray diffraction.

For abstract, see NSA 28 02, number 05063.

UJV-2866-CH/GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Rez. Ustav Jaderneho Vyzkumu.
HYDROTHERMAL REDUCTION OF URANIUM TRIOXIDE.
Z. Urbanec. Jan 73, 11p
U.S. Sales Only.

Descriptors: (*Uranium trioxide, *Reduction), Crystal structure, Ethanol, Hydrates, Temperature dependence.

For abstract, see NSA 28 02, number 02396.

7C. Organic Chemistry

AD-767 082/1GA PC$3.00/MF$1.45
Naval Weapons Center China Lake Calif
FLUORESCENCE SPECTRA AND QUANTUM YIELDS: QUININE, URANINE, 9,10-DIPHENYLANTHRACENE AND 9,10-BIS(PHENYLETHYNYL) ANTHRACENES.
Technical rept.,
Carl A. Heller, Ronald A. Henry, and Bruce A. McLaughlin. Sep 73, 39p Rept no. TR-3

Descriptors: (*Cinchona alkaloids, *Fluorescence), (*Anthracenes, Fluorescence), (*O-heterocyclic compounds, Fluorescence), Spectra(Visible + ultraviolet), Sulfates.
Identifiers: Quantum efficiency, Emission spectra, *Quinine, *Fluorescein, Organic sulfates, Anthracene/bis(phenylethynyl), Anthracene/diphenyl.

Spectra and quantum yields obtained on a corrected spectrum Turner Spectrofluorometer are carefully tabulated for quinine, uranine, 9,10-diphenylanthracene, and 9,10-bis(phenylethynyl) anthracenes. Our quinine sulfate spectrum is compared to a literature spectrum using a simple ratio method which is suggested as generally useful. Some effects of substitution on the anthracene rings of 9,10-bis(phenylethynyl) anthracene are shown. (Modified author abstract)

AD-767 245/4GA PC$2.75/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
MASS SPECTRAL CHARACTERIZATION OF SAMPLES FROM A POTASSIUM BROMIDE MATRIX.
Memorandum rept.,
Arpad A. Juhasz, J. J. Rocchio, and J. Omar Doali. Jul 73, 16p Rept no. BRL-MR-2314

Descriptors: (*Mass spectroscopy, Propellants), (*Microanalysis, Mass spectroscopy), (*Propellants, Microanalysis), Infrared spectroscopy, Bromides, Potassium compounds, Adsorption, Amines, DNT, Organic nitrogen compounds, Chemical analysis, Ureides.
Identifiers: Potassium bromide, Matrix isolation techniques, Diphenylamines, Diphenylamine/nitro, Carbanalide/diethyl.

Techniques were developed for mass spectral characterization of materials adsorbed on a potassium bromide (KBr) matrix. Samples intimately mixed with KBr are placed into a solids inlet probe and heated to volatilize the material into the mass spectrometer. The spectra obtained by this technique are essentially identical to spectra from neat samples. The method was found to be readily applicable to the analysis of a variety of propellant ingredients. Examples presented include diphenylamine, dinitrotoluene, 2-nitrodiphenylamine and ethyl centralite. Good mass spectra have been obtained from twenty microgram samples. This advance makes possible both infrared and mass spectral characterization of a single micro-sample. (Author)

AD-767 269/4GA PC$3.00/MF$1.45
Army Weapons Command Rock Island Ill General Thomas J Rodman Lab
SYNTHESIS OF IMIDE-SILOXANE AND AMIDE-SILOXANE COPOLYMERS.
Technical rept.,
William S. Shore. May 73, 43p* Rept no. AMSWE-R-RR-T-6-26-73

Descriptors: (*Siloxanes, *Copolymerization), (*Imides, Copolymerization), (*Polyamide plastics, Copolymerization), (*Elastomers, Thermal stability), Thermoplastics, Mechanical properties, Sulfuric acid, Synthesis(Chemistry), Cross-linking(Chemistry), Spectra(Infrared).
Identifiers: Performance evaluation, *Polyimide resins, *Poly(benzodipyrollediyl/dihydro-tetraoxo).

The synthesis of copolymers is described in which disiloxane units are alternated with imide or amide units along the main polymer chains. Through the synthesized products met the goals of improved thermal stability and crosslinkability, neither remained rubbery to low enough temperatures. The procedure has two advantages compared to other methods: (1) the thermally rigorous imidization occurs independently of the polymerization process, and (2) only one organic material, which is stable in air, needs to be purified. The relatively inert disilane requires no special procedures to protect its purity, and exacting procedures are unnecessary to ensure that stoichiometric quantities are present and react to form high molecular weight polymer. Infrared spectra of the polymers and their precursor silyl derivatives correspond well with those of other similar compounds. (Modified author abstract) Portions of this document are not fully legible.

AD-767 285/0GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge
BEHAVIOR OF ORGANIC DYE SOLUTION LASERS.
Final rept. 1 Nov 69-31 May 73,
Jeffrey I. Steinfeld. 31 Aug 73, 44p AROD-8658:4-P
Contract DAHC04-70-C-0015

Descriptors: (*Lasers, Dyes), (*Dyes, Spectra(Visible + ultraviolet)), Reaction kinetics, Fluorescence, Pumping(Optical), Photochemistry, Quenching(Inhibition), Gas analysis, Nitrogen oxides, Molecular energy levels, Chemical equilibrium, Absorption, Chlorides, Iodine compounds, Aldehydes.
Identifiers: Emission spectra, Air pollution detection, *Rhodamine 6G, *Xanthene dyes, Absorptivity, *Organic dye lasers.

The report summarizes research in which the authors have examined the time development of the various frequencies in a grating-tuned, flashpumped dye solution laser and interpreted these in terms of a four-state kinetic model that they have previously used with success for a description of molecular gas lasers. One of the significant parameters in the description of this model is the extent and nature of the homogeneous broadening in the dye molecule, and they have investigated this aspect by studying the temperature and solvent state dependence of dye absorption and emission spectra. Radiative lifetimes and self-quenching cross sections have been determined for glyoxyl and iodine monochloride using tuned laster pulses. Another promising application of the dye laser is in detection of trace quantities of such contaminants as NO2 in the atmosphere. Detection limits for such a monitoring system have been estimated. (Modified author abstract)

AD-767 290/0GA PC$2.75/MF$1.45
Utah State Univ Logan
PREPARATION OF DERIVATIVES OF IMINOBORANE.
Final rept. 1 Mar 70-30 Jun 73,
Joseph G. Morse, W. K. Glanville, and Earl C. Andersen. 17 Aug 73, 25p AROD-8514:1-C
Grant DA-ARO-D-31-124-70-G52

Descriptors: (*Imines, Synthesis(Chemistry)), (*Organoboranes, *Synthesis(Chemistry)), (*Phosphines, *Free radicals), Organic phosphorus compounds, Spectra(Infrared), Mass spectroscopy, Fluorides, Chemical reactions, Molecular structure, Pyrolysis.
Identifiers: Aniline/methoxy-phenlborylene, Aniline/trimethylphenyl-phenylborylene, Borane/amino, *Corboranes, Phosphonous difluoride/ethylene-bis.

An investigation into synthesis and isolability of derivatives of iminoborane, HBNH, is reported. The pyrolytic method first described has been shown to be less effective than initially believed. A chemical synthesis from arylboron dichloride and primary amines is described. The state of characterization of compounds ArBNR where Ar=C6F5 and R=C6H4OCH3, C6H2(CH3)3, i-C3H7, and i-C4H9 is discussed. Additional experiments necessary for complete confidence in structural assignment are described. Some preliminary results concerning the free radical reactions of P2F4 are also described. (Author)

AD-767 487/2GA Reprint
Wisconsin Univ Madison Dept of Chemistry
NEW ANIONIC REARRANGEMENTS. XV. 1,2-ANIONIC REARRANGEMENT OF ORGANOSILYLHYDROXYLAMINES,
Robert West, and Philip Boudjouk. 20 Dec 71, 10p AFOSR-TR-73-1731
Grant AF-AFOSR-1904-70
See also report dated 30 Jun 71, AD-742 195.
Availability: Pub. in Jnl. of the American Chemical Society, v95 n12 p3987-3994, 13 Jun 73.

Descriptors: (*Silanes, Chemical reactions), (*Amines, Chemical reactions), Nuclear magnetic resonance, Spectra(Infrared), Ions, Molecular structure, Lithium compounds, Salts.
Identifiers: *Rearrangement reactions, Anions, Silicon organic compounds, Chemical reaction mechanisms, *Hydroxylamine.

Mono- and bis(organosilyl)hydroxylamines, when treated with 1 equiv of alkyllithium, undergo 1,2-anionic rearrangement with migration of the organosilicon group from oxygen to nitrogen. The rearrangement of bis(organosilyl)hydroxylamines was studied in detail; ir, nmr and chemical evidence shows that, upon deprotonation, migration of the organosilyl group occurs intramolecularly to form an equilibrium mixture of unrearranged and rearranged anions and that the rearranged anion is predominant. This is the first example of a 1,2-anionic rearrangement from oxygen to nitrogen. (Author)

AD-767 493/0GA Reprint
Wisconsin Univ Madison Dept of Chemistry
ORGANOSILYL AND ORGANOGERMYL NITROXIDES. A NEW RADICAL REARRANGEMENT,
Robert West, and Philip Boudjouk. 20 Dec 71, 7p AFOSR-TR-73-1730
Grant AF-AFOSR-1904-70
Availability: Pub. in Jnl. of the American Chemical Society, v95 n12 p3983-3987, 13 Jun 73.

Descriptors: (*Nitrogen compounds, Free radicals), (*Silanes, Chemical reactions), (*Germanium compounds, Chemical reactions), Hyperfine structure, Nuclear magnetic resonance, Spectra(Infrared), Electron spin resonance, Molecular orbitals, Amines.
Identifiers: Silicon organic compounds, *Rearrangement reactions, Germanium organic compounds, *Nitroxides.

Bis(organosilyl)nitroxide radicals (RME2Si)2NO, where R = Me, Et, Ph, t-Bu have been obtained by (1) electrolytic or (2) oxygen oxidation of bis(organosilyl)hydroxylamine anions and by (3) hydrogen abstraction and radical rearrangement of the N,O-bis(organosilyl)hydroxylamines (the first example of an O to N radical rearrangement). Esr spectra of bis(organosilyl)nitroxides show very low A(N) values, consistent with strong dative bonding from nitrogen to silicon and consequent unpaired electron localization on oxygen. Me3Ge(t-BuMe2Si)NO, (Me3Ge)2NO, and (t-BuMe2Ge)2NO were also prepared from the corresponding hydroxylamines. (Modified author abstract)

AD-767 560/6GA PC$2.75/MF$1.45
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
HYDROCARBON-TYPE ANALYSIS OF GASOLINE USING STABILIZED OLEFIN ABSORPTION AND GAS CHROMATOGRAPHY.
Final rept.,
Leo L. Stavinoha. Sep 73, 17p* Rept no. AFLRL-23
Contracts DAAK02-73-C-0221, DAAD05-72-C-0053

Descriptors: (*Gas chromatography, *Gasoline), (*Chromatographic analysis, Gasoline), (*Hydrocarbons, Gas chromatography), Alkanes, Alkenes, Aromatic compounds, Cycloalkanes, Chemical analysis, Separation.
Identifiers: Performance evaluation, Precision.

A gas chromatographic technique has been evaluated for the precise determination of the saturate, olefin, and aromatic composition of motor gasoline. This procedure extends the capability of a test technique used to isolate the aromatic and saturate-olefin fractions of gasoline through the addition of a dual-column valve, olefin-absorber column, and humidified carrier gas for olefin-absorber stabilization in a 60C, temperature-controlled oven. The precutting column and the backflush valve used to isolate the aromatic fraction from the saturate-olefin fraction were located in a separate 120C, temperature-controlled oven. Two precise sample injections using a high-pressure/high-temperature valve are required to determine the peak areas attributed to the saturate fraction and to the olefin fraction. For volumetric analyses, the aromatic concentration was determined by comparing the aromatic peak with that of a standard. The remaining concentration of the sample was assigned to the saturate and olefin fractions based on the area attributed to each. The precision of this technique has been evaluated for 12 gasolines having olefin and aromatic concentrations ranging from 2 and 9 to 46 and 50 percent volume, respectively. Data from and advantages of this technique are compared to that of other hydrocarbon techniques. (Author)

COM-73-11542/0GA Reprint
Wisconsin Univ., Madison. Dept. of Food Science.
URETHANE POLYMERS FROM HYDROXYLATED FISH OIL,
G. O. Hustad, T. Richardson, and C. H. Amundson. 6 Apr 70, 6p WIS-SG-71-306 NOAA-73070203
Pub. in Jnl. of the American Oil Chemists' Society, v47 n9 p333-336 Sep 70.

Descriptors: (*Oils, Polymerization), (*Polyurethane resins, Synthesis(Chemistry)), Polyether resins, Elastomers, Mechanical properties, Castor oil, Foam, Cellular plastics, Fish protein concentrates.
Identifiers: *Fish oils, Hydroxylation.

The authors report the results of using three hydroxylation procedures on alewife oil and one on menhaden oil to form polyhydroxy compounds. The results of using fish oil polyols along with conventional polymerization procedures to produce urethane foams and urethane elastomers are also presented. Several physical properties of fish oil-urethane foams are reported and compared to a conventional polyether foam. Several physical properties of fish oil urethane elastomers are compared with a castor oil elastomer.

COM-73-50774/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MICROWAVE SPECTRUM, DIPOLE MOMENT, AND CONFORMATION OF 3,6-DIOXABICYCLO (3.1.0) HEXANE.
Final rept.,
R. A. Creswell, and Walter J. Lafferty. 1973, 10p
Sponsored in part by Leverhulme Foundation, London, England.
Pub. in Jnl. of Molecular Spectroscopy, v46 n3 p371-380 Jun 73.

Descriptors: (*Dioxanes, *Microwave spectra), Molecular rotation, Oxygen heterocylic compounds, Polycyclic compounds, Dipole moments, Molecular structure, Ground state, Molecular energy levels, Stereochemistry.
Identifiers: Bicyclohexanes, Molecular conformations.

The microwave spectrum of 3,6-dioxabicyclo(3.1.0) hexane has been obtained. The rotational lines of one ring conformation only have been observed and assigned. Ground state rotational constants and the dipole moment components obtained from Stark effect measurements are reported. The rotational constants and dipole moment components obtained experimentally can be satisfactorily explained only if the boat form is the most stable ring conformation.

COM-73-50793/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FACILE COUPLING OF STERICALLY HINDERED 2,6-DIALKYLPHENOLS WITH PERIODIC ACID.
Final rept.,
Alexander J. Patiadi. 1973, 2p
Pub. in Synthesis Communications, n6 p357-358 Jun 73.

Descriptors: (*Phenols, Chemical reactions), Molecular structure, Quinones, Oxidation.
Identifiers: Periodic acids.

A procedure has been developed by which sterically hindered phenols can produce coupling products (diphenoquinones) in 60 to 94% yield when treated with periodic acid in an aqueous N,N-dimethylformamide.

ITF-73-1-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
CONFIGURATIONAL CHANGES AND OPTICAL PROPERTIES OF ALPHA-HELICAL PROTEIN MOLECULES.
A. S. Davydov, and A. D. Suprun. 1973, 14p
In Russian. U.S. Sales Only.

Descriptors: (*Proteins, *Molecular structure), Configuration, Excited states, Interactions, Optical properties, Peptides.

For abstract, see NSA 28 03, number 07721.

JUL-911-AC/GA PC$4.00/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Zentralinstitut fuer Analytische Chemie.
TECHNIQUES AND MATERIALS IN MICRO AND TRACE ANALYSIS. I. CONSTANT WEIGHT AND WATER PERMEABILITY TESTS OF POLYOLEFINIC VIALS.
F. v. Ameln, A. Belouadah, and M. Stoeppler. Dec 72, 37p
In German. U.S. Sales Only.

Descriptors: (*Chemical analysis, *Laboratory equipment), Configuration, Containers, Permeability, Polyethylenes, Trace amounts, Water, Weight.

For abstract, see NSA 28 03, number 07728.

LA-UR-73-61/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
POLYMERIC PRECURSORS OF CARBON.
E. M. Wewerka. 1973, 6p CONF-730507-2

Descriptors: (*Carbon, *Chemical preparation), (*Polymers, *Carbonization), (*Graphite, *Binders), Fabrication, Fibers, Reviews.

For abstract, see NSA 28 03, number 07732.

LA-UR-73-62/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
GRAPHITE BINDERS FROM AROMATIC-HYDROCARBON POLYMERS.
J. M. Williams, E. M. Wewerka, and R. J. Imprescia. 1973, 6p CONF-730507-3

Descriptors: (*Graphite, *Binders), Aromatics, Hydrocarbons, Organic polymers.

For abstract, see NSA 28 03, number 07733.

LA-5235-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
CONTINUOUS CRYSTALLIZATION OF HIGH EXPLOSIVES.
L. E. Hatler. Apr 73, 19p
Contract W-7405-eng-36

Descriptors: (*Chemical explosives, *Chemical preparation), Carbonic acid derivatives, Crystallization, Organic nitrogen compounds.

For abstract, see NSA 28 03, number 07730.

N73-27090/2GA PC$3.75/MF$1.45
Institut fuer Chemie der Treibstoffe, Berghausen (West Germany).
REACTIONS OF UREA WITH CARBOHYDRAZIDE REAKTIONEN VON HARNSTOFF MIT CARBOHYDRAZID.
W. Engel. 30 Nov 72, 31p ICT-5/72
Language in German.

Descriptors: *Chemical reactions, *Hydrazides, *Ureas, Aqueous solutions, Smelting.

For abstract, see STAR 1118

PATENT-3 678 088/GA Not available NTIS
Department of the Air Force Washington D C
POLYCHLORINATED METALLOCENES AND THEIR SYNTHESIS.
Patent,
Frederick L. Hedberg, and Harold Rosenberg.
Filed 24 Feb 71, patented 18 Jul 72, 9p Rept nos. PAT-APPL-118 495,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50. * *

Descriptors: (*Patents, Metalorganic compounds), (*Metalorganic compounds, *Chlorination), (*Ferrocenes, Chlorination), Halogenated hydrocarbons, Chlorine compounds, Synthesis(Chemistry), Chromium compounds, Osmium compounds, Thermal stability.
Identifiers: PAT-CL-260-249, Chlorine organic compounds.

The patent concerns novel polychlorinated metallocenes that have the following formulas: C5H(5-m)Cl(m)MC5H5 and (C5H(5-n)Cl(n))2M, wherein M is iron, ruthenium or osmium, m is an integer from 3 to 5, inclusive, and n is an integer from 2 to 5, inclusive. The products are prepared by reacting

a monochlorometallocene or a 1,1'-dichlorometallocene with an organolithium compound in the presence of a solvent, recovering a 1-chloro-2-lithiometallocene or a 1,1'-dichloro-2,2'-dilithiometallocene, and then reacting one of the latter compounds with a chlorination agent to obtain 1,2-dichlorometallocene or 1,1',2,2'-tetrachlorometallocene. The lithiation step and the chlorination step can then be repeated. The polychlorinated metallocenes are useful in preparing metallocene-containing polymers that are particularly suitable as ablative plastics. They also can be used to synthesize high temperature and/or high density fluids as well as for additives for lubricants and as flame retardant additives.

PATENT-3 687 908/GA Not available NTIS
Department of the Air Force Washington D C
POLYMERS CONTAINING NITRILE AND THIOAMIDE GROUPS AND THEIR PREPARATION.
Patent,
Lewellyn G. Picklesimer. Filed 2 Feb 71, patented 29 Aug 72, 6p Rept nos. PAT-APPL-112 021,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Polymers), (*Nitriles, *Polymers), (*Polyamide plastics, Synthesis(Chemistry)), Organic sulfur compounds, Acrylonitrile polymers, Vinyl plastics, Catalysts, Alkali metal compounds, Carbonates, Films, Fibers(Synthetic), Coatings, Cyanides.
Identifiers: PAT-CL-260-79-5, *Thioamides, *Vinylidene resins, Polynitriles, Hydrogen sulfide.

The patent describes how novel polymers containing nitrile and thioamide groups are prepared by contacting a polymer of acrylonitrile or vinylidene cyanide with hydrogen sulfide at a temperature below about 50C in the presence of a catalytic amount of an alkali metal carbonate. The polymers are useful as coatings and in the preparation of fibers and films.

PATENT-3 723 513/GA Not available NTIS
Office of the Secretary of the Army Washington D C
ORGANIC DISULFIDE SULFINIC ACID COMPOUNDS.
Patent,
Lamar Field, and Robert B. Barbee. Filed 6 Nov 69, patented 27 Mar 73, 4p Rept nos. PAT-APPL-874 677,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Radioprotective agents), (*Sulfides, *Radioprotective agents), (*Organic sulfur compounds, Radioprotective agents), Sulfinic acids, Sulfonates, Sulfoxides, Synthesis(Chemistry), S-heterocyclic compounds.
Identifiers: PAT-CL-260-513-7, Organic sulfides.

The patent describes organic disulfide compounds, useful as antiradiation agents, having the general formula ANH-Y-S-S-((CR2)n)SOqM and their synthesis by subjecting 1,1-dioxides of heterocyclic disulfides to the action of a thiolate ion. In the general formula: A may be a hydrogen, alkyl, or acyl grouping; Y may be a straight or substituted aliphatic chain having two or three carbon atoms; R may be hydrogen, alkyl, aryl, or cycloalkyl; n may be the integers 3 through 5; q is 2 or 3; and M may be hydrogen or a metallic element as selected from group 1A.

PATENT-3 726 802/GA Not available NTIS
Department of the Navy Washington D C
LOW TEMPERATURE CHEMILUMINESCENT FORMULATIONS.
Patent,
Carl H. Morley, and Everett M. Bens. Filed 30 Jul 65, patented 10 Apr 73, 3p Rept nos. PAT-APPL-476 788,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Chemiluminescence), (*Ethylenes, Chemiluminescence), (*Chemiluminescence, Low-temperature research), Organic nitrogen compounds, Chemical reactions.
Identifiers: PAT-CL-252-188-3, *Ethene tetramine/octamethyl.

The patent relates to a method and formulation for extending the chemiluminescence of tetrakis(dimethylamino)ethylene to temperatures below zero degrees centigrade.

PATENT-3 726 920/GA Not available NTIS
Office of the Secretary of the Army Washington D C
1,3-BIS(4-CHLOROPHENYL)-2-PROPEN-1-ONE GUANYLHYDRAZONE HYDROCHLORIDE AND ANALOGS THEREOF USEFUL AS ANTIMALARIALS.
Patent,
David W. Henry. Filed 6 Jan 70, patented 10 Apr 73, 4p Rept nos. PAT-APPL-1 061,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Antimalarials), (*Guanidines, *Antimalarials), (*Hydrazones, Antimalarials), Synthesis(Chemistry), Aromatic compounds, Halogenated hydrocarbons, Chlorine compounds.
Identifiers: PAT-CL-260-564-F.

The patent describes the preparation of three analogous compounds, 1,3-bis(4-chlorophenyl)-2-propen-1-one guanylhydrazone hydrochloride, 1,3-bis(4-chlorophenyl)-2-buten-1-one guanylhydrazone hydrochloride, and 1,3,3-tris(4-chlorophenyl)-2-propen-1-one guanylhydrazone hydrochloride. The compounds are useful in the prevention and treatment of malaria.

PATENT-3 732 305/GA Not available NTIS
Office of the Secretary of the Army Washington D C
S-SUBSTITUTED THIOSULFURIC ACID DERIVATIVES AND PREPARATION THEREOF.
Patent,
Ludwig Bauer. Filed 3 Mar 70, patented 8 May 73, 5p Rept nos. PAT-APPL-16 240,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Radioprotective agents), (*Thiosulfates, Radioprotective agents), (*Organic sulfur compounds, *Radioprotective agents), Synthesis(Chemistry), Polycyclic compounds, Lipids, Solubility, Organic nitrogen compounds.
Identifiers: PAT-CL-260-564-R, Performance evaluation.

The patent describes antiradiation compounds comprising a molecule which includes a component with antiradiation properties linked to a component with substantial lipid solubility. The seven compounds are S-4(N-substituted carboxamidinium)methyl5 thiosulfuric acids (Bunte salts) having the general formula (-)O3SSCH2C(=NH2(+)NHR and hydrolysis products thereof, wherein R represents bi- and tricyclic aliphatic ring systems. The antiradiation effectiveness is reported.

PATENT-3 733 319/GA Not available NTIS
Office of the Secretary of the Army Washington D C
NITROTHIOPHENES.
Patent,
David W. Henry, and William T. Colwell, Jr. Filed 7 Jan 70, patented 15 May 73, 6p Rept nos. PAT-APPL-1 301,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Thiophenes, Synthesis(Chemistry)), (*Patents, Thiophenes), (*Antimalarials, Thiophenes), Organic nitrogen compounds, Hydrazones.
Identifiers: PAT-CL-260-240-A, *Nitro compounds.

The patent describes eighteen analogs of 5-nitrothiophene 2-carboxaldehyde. The compounds are useful in the prevention and treatment of malaria.

PATENT-3 745 149/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PREPARATION OF POLYIMIDES FROM MIXTURES OF MONOMERIC DIAMINES AND ESTERS OF POLYCARBOXYLIC ACIDS.
Patent.
T. T. Serafini, P. Delvigs, and G. R. Lightsey.
Patented 10 Jul 73, 6p NASA-CASE-LEW-11325-1,
Misc-Filed 29 Sep. 1971 Supersedes N72-10134 (10 - 01, p 0021).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Carboxylic acids, *Diamines, *Polyimides, *Synthesis, Oxidation, Patents, Polymer chemistry, Resistance, Thermal stability.

Polyimides having high thermal and oxidative stability are prepared by the reaction of a mixture of monomers comprising (1) a dialkyl or tetraalkyl ester of an aromatic tetracarboxylic acid; (2) an aromatic diamine; and (3) a monoalkyl or dialkyl ester of a dicarboxylic acid where in the ratio of a:b:c is n:(n+1):2, wherein n has a value from 1 to 20. The mixture of monomers is prepared in a 30 to 70 percent by weight solution of an organic solvent, a substrate impregnated with the solution and heated at 50 to 205 C to remove said solvent and form a low molecular weight prepolymer, and thereafter heated at 275 to 350 C to cure to a high molecular weight polyimide.

TT-71-51002/GA PC$2.75/MF$1.45
Forest Service, Washington, D.C.
MECHANISM OF OXIDATION OF CELLULOSE AND ITS APPROXIMATE MODELS WITH ATMOSPHERIC OXYGEN (O MEKHANIZME OKISLENIYA TSELLYULOZY I EE PRIBLIZHENNYKH MODELEI KISLORODOM VOZDUKHA),
O. P. Golova. 1973, 9p
Trans. of Vysokomolekulyarnye Soedineniya (USSR) v2 n3 p337-340 1960. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Cellulose, Oxidation), Depolymerization, Alkalinity, Glycosides, Atmospheric corrosion, Oxidation resistance, USSR, Translations.
Identifiers: Chemical reaction mechanisms.

The translation studies the mechanism of oxidation of cellulose and approximate models by molecular oxygen. Methylgluosides and high purity cellulose were studied in alkaline medium.

TT-71-51004/GA PC$2.75/MF$1.45
Forest Service, Washington, D.C.
MECHANISM OF THE OXIDATIVE DEGRADATION OF CELLULOSE IN ALKALINE MEDIUM (K VOPROSU O MEKHANIZME OKISLITELNOGO RASPADA TSELLYULOZY V SHCHELOCHNOI SREDE),
N. S. Mayat. 1973, 13p
Trans. of Vysokomolekulyarnye Soedineniya (USSR) v6 n9 p1693-1698 1964. Sponsored in part

by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Cellulose, *Oxidation), Alkalinity, Degradation, Cellulose esters, Chemical reactions, Chromatographic analysis, Hydrolysis, Depolymerization, Atmospheric corrosion, Translations, USSR.
Identifiers: Chemical reaction mechanisms.

The translation studies the mechanism of degradation of cellulose by molecular oxygen in alkaline medium. The approach used was the study of the structure of degradation products of hydrolysis by identification with paper chromatography.

TT-72-51052/GA PC$2.75/MF$1.45
Agricultural Research Service, Washington, D.C.
SYNTHESIS OF GRAFTED COPOLYMER OF CELLULOSE WITH POLY-1, 1, 2-TRICHLOROBUTADIENE (SINTEZ PRIVITOGO SOPOLIMERA TSELLYULOZY S POLI-1, 1, 2-TRIKHLORBUTADIENOM),
R. G. Grigoryan. 1973, 9p
Trans. of Promyshlennost Armenii (USSR) n7 p38-41 1970. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Butadiene copolymers, Mechanical properties), Acid resistance, Durability, Graft polymerization, Cellulosic resins, Physical properties, Translatons, Tensile strength, Elongation, Chemical reactions, Fabrics, Synthetic fibers, USSR, Chlorine organic compounds.
Identifiers: Copolymerization, Chlorinated polymers.

The translation deals with the study of conditions of synthesis of grafted copolymer of cellulose with poly-1, 1, 2-trichlorobutadiene and its physico-mechanical properties, including its behavior in fabrics.

7D. Physical Chemistry

AD-767 059/9GA PC$2.75/MF$1.45
Yale Univ New Haven Conn Dept of Engineering and Applied Science
VIBRATIONAL EXCITATION OF MOLECULES VIA SHAPE RESONANCES.
Technical rept.,
George J. Schulz. 1973, 23p
Contract N00014-67-A-0097-0025

Descriptors: (*Nitrogen, Electron bombardment), (*Oxygen, Electron bombardment), (*Carbon dioxide, Electron bombardment), Molecular energy levels, Excitation, Molecular orbitals.
Identifiers: Molecular vibration, *Vibrational energy levels, Cross sections, Resonance.

The paper presents a survey of the progress made in understanding vibrational excitation of molecules by electron impact, with special emphasis on new results obtained in the past year. It is shown that the properties of the shape resonance in the specific molecules determine the behavior of the vibrational cross sections at low energies. Thus the lifetime and the energy of the resonances are determining factors. Examples are given for N2, O2, and CO2. For the case of N2, the cross sections to high vibrational states, up to v = 10 are discussed for the energy range 2-4 eV. For O2, we present data in the energy range 0-14 eV and for CO2, new data for the 3.8 eV resonance are shown. (Modified author abstract)

AD-767 078/9GA PC$3.75/MF$1.45
Andros Inc Berkeley Calif
INVESTIGATION OF THE FEASIBILITY OF AN NDIR TECHNIQUE TO DETECT CO2 IN A HYPERBARIC GASEOUS ENVIRONMENT.
Final rept.,
Kevin G. Williams. Sep 73, 92p Rept no. ARFR-56
Contract N00014-73-C-0185

Descriptors: (*Carbon dioxide, *Gas detectors), Infrared spectroscopy, Gas analysis, Pressure breathing, Diving.
Identifiers: *Nondispersive infrared spectroscopy, Hyperbaric atmospheres, Breathing apparatus, Performance evaluation.

A nondispersive infrared (NDIR) technique for monitoring CO2 has been thoroughly evaluated to determine its suitability for use in a hyperbaric environment. The technique used is to subject a known volume of sample gas to a periodic density modulation and to measure the amount of CO2 present by observing the fractional change in a beam of infrared radiation transmitted through that volume. Experimental results indicate the validity of the technique for total pressures up to 1200 psia, in He containing up to 15 psia of O2/N2, and CO2 partial pressures up to 30 mm. A single point calibration with CO2 span gas at any pressure should be necessary only infrequently. Response times of the order of a few seconds are possible. It is anticipated that this technique can be used in a CO2 alarm sensor for inclusion in a saturation diver's breathing apparatus, as well as in hyperbaric habitats and Personnel Transfer Capsules. (Modified author abstract)

AD-767 088/8GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
PREDICTION OF NEW MULTIPLET STRUCTURE IN PHOTOEMISSION EXPERIMENTS,
P. S. Bagus, A. J. Freeman, and F. Sasaki. 10 Jan 73, 6p AFOSR-TR-73-1604
Grant AF-AFOSR-2012-71
Availability: Pub. in Physical Review Letters, v30 n18 p850-853 1973.

Descriptors: (*Manganese, Atomic energy levels), Electron transitions, X rays, Metals, Photoelectrons.
Identifiers: *Photoelectron spectroscopy, X ray photoelectron spectroscopy, Correlation effects.

Correlation effects are included in a detailed theoretical study of the multiplet structure observed by x-ray photoelectron spectroscopy. This correlated multiplet hole theory resolves the difficulties of earlier multiplet hole theory studies: It correctly determines the magnitude of the observed 2s and 3s (doublet) splittings and their intensity ratios, and predicts the existence of new structure for the 3s binding energy splittings--structure which does not exist in one-electron theory. (Modified author abstract)

AD-767 108/4GA Reprint
Tennessee Univ Knoxville
STRUCTURE OF HIGHER STRIPPED NITROGEN, OXYGEN, FLUORINE, CHLORINE, AND ARGON IONS.
Technical rept. 1 Mar 72-31 Aug 73,
Ivan A. Sellin. 17 Sep 73, 55p
Contract N00014-71-A-0121-0002
Availability: Pub. in various jnls. 55p Sep 73.

Descriptors: (*Stripped atom, Scientific research), Nitrogen, Oxygen, Fluorine, Chlorine, Argon, Ions, Neon, X rays, Atomic energy levels, Excitation, Gas ionization, Sulfur.
Identifiers: Emission spectra, *Autoionization.

This document is a technical report concerning work performed to date on the project entitled 'Structure of Higher Stripped Nitrogen, Oxygen, Fluorine, Chlorine, and Argon Ions.' Reprints received to date plus abstracts of work to be published are included.

AD-767 109/2GA Reprint
Chicago Univ Ill James Franck Inst
EXCITONIC DOUBLETS IN MIXED CRYSTALS OF ALKALI AND CUPROUS HALIDES: COHERENT-POTENTIAL APPROXIMATION,
Pabitra N. Sen. 4 Aug 72, 7p AROD-8595:32-P
Grant DA-ARO-D-31-124-72-G152
Availability: Pub. in Physical Review Letters, v30 n12 p553-556, 19 Mar 73.

Descriptors: (*Alkali metal compounds, Excitons), (*Copper compounds, Excitons), Halides, Crystals, Band theory of solids, Doping.
Identifiers: *Coherent potential approximation, Copper halides.

The coherent-potential approximation (CPA) is generalized to include two bands with band mixing and is applied to the excitonic doublets of mixed crystals of alkali and cuprous halides. These systems are almost an ideal testing ground for the two-band CPA; most of the parameters needed to predict peak positions, intensity ratio, and linewidths, for an arbitrary composition, are known from independent experiments. Agreement between CPA calculations and experiments is very encouraging. (Author)

AD-767 113/4GA Reprint
IBM Research Lab San Jose Calif
EFFECT OF ROTATION ON VIBRATIONAL EXCITATION OF H2 BY LI(+) IMPACT,
William A. Lester, Jr., and Joachim Schaefer. 18 Apr 73, 9p
Contract N00014-72-C-0244
Availability: Pub. in Chemical Physics Letters, v20 n6 p575-580, 15 Jul 73.

Descriptors: (*Hydrogen, Excitation), Numerical analysis, Lithium, Ion bombardment, Inelastic scattering.
Identifiers: Molecular rotationa, *Vibrational energy levels, *Ion molecule interactions, Cross sections.

Coupled channel calculations of integral cross sections for rotational and vibrational excitation of H2 by collision with Li(+) are reported for 1.2 eV in the c.m. system employing an ab initio potential energy surface and numerical vibration-rotation functions of the Kolos-Wolniewicz potential function including adiabtic correction. Pure rotational excitational excitation is found to strongly dominate the inelastic scattering at this energy. Preparation of H2 in various allowed non-zero rotational states is seen to enhance the 0 to 1 vibrational cross section by approximately an order of magnitude. (Modified author abstract)

AD-767 114/2GA Reprint
Franklin Inst Swarthmore Pa Bartol Research Foundation
CS AND H2 ADSORPTION ON W(100),
C. A. Papageorgopoulos, and J. M. Chen. 29 May 73, 7p AROD-8906:5-P
Grant DA-ARO-D-31-124-73-G124
Availability: Pub. in Jnl. of Physics C: Solid State Physics, v6 pL279-L282 1973.

Descriptors: (*Cesium, Adsorption), (*Tungsten, *Adsorption), Crystal structure, Hydrogen, Electron diffraction analysis, Work functions.
Identifiers: Low energy electron diffraction, Hydrogen atoms.

By using LEED and workfunction measurements, it has been found that a previously reported c(2x2) structure for Cs on W(100) was due to a small amount of H accumulated on the surface at the beginning of Cs deposition. These H atoms, in the presence of Cs, form patches of c(2x2). (Author)

AD-767 116/7GA Reprint
North Carolina Univ Chapel Hill
RESONANCE PHOTOELECTRON SPECTROSCOPY FROM AUTOIONIZATION STATES OF CH3I,
Tomas Baer, and Bilin P. Tsai. 7 Dec 72, 11p
AROD-10200:1-C
Contract DAHC15-67-C-0223, Grant DA-ARO-D-31-124-72-G20
Availability: Pub. in Jnl. of Electron Spectroscopy and Related Phenomena, v2 p25-32 1973.

Descriptors: (*Halogenated hydrocarbons, Molecular spectroscopy), Ionization, Iodine compounds, Photoelectrons, Molecular energy levels.

Identifiers: *Methane/iodo, *Photoelectron spectroscopy, Molecular vibration, Autoionization, Configuration interaction method.

Resonance photoelectron spectra of methyl iodide have been taken by exciting individual autoionizing Rydberg states, and measuring the ejected electron energies by a time of flight technique. A number of spectra were obtained from autoionization states which are members of two series, converging to the v=0 and v2=1 states of the ion. In addition to observing vibrational bands not previously reported, we found that the peak intensities are consistent with Bardsley's formulation of the configuration interaction theory of autoionization. (Modified author abstract)

AD-767 141/5GA Reprint
Chicago Univ Ill James Franck Inst
INHOMOGENEOUS TRANSPORT REGIME IN DISORDERED MATERIALS,
Morrell H. Cohen , and Joshua Jortner. 8 Jan 73, 7p AROD-8595:30-P
Grant DA-ARO-D-31-124-72-G152
Prepared in cooperation with Tel-Aviv Univ. (Israel). Dept. of Chemistry.
Availability: Pub. in Physical Review Letters, v30 n15 p699-702, 9 Apr 73.

Descriptors: (*Electrical conductance, Semiconductors), Mercury, Tellurium, Hall effect, Transport properties.
Identifiers: *Semiconductor metal transition.

The authors propose the existence of an inhomogeneous transport regime in the disordered materials in which a gradual metal-semiconductor transition occurs. This regime is subdivided into pseudometallic and pseudosemiconducting parts by a percolation threshold. On the basis of an effective-medium theory, it is proposed that the pseudometallic regime falls in the density range 8.2-9.3 g/cc in liquid Hg and in the temperature range 1200K to below 670K in liquid Te. (Author)

AD-767 144/9GA Reprint
Stanford Univ Calif Microwave Lab
POLLUTANT DETECTION BY ABSORPTION USING MIE SCATTERING AND TOPOGRAPHIC TARGETS AS RETROREFLECTORS,
Robert L. Byer, and Max Garbuny. 13 Nov 72, 13p AROD-7580:12-P
Grant DA-ARO-D-31-124-72-G184
Availability: Pub. in Applied Optics, v 12 n7 p1496-1505 Jul 73.

Descriptors: (*Air pollution, *Gas analysis), Lasers, Rayleigh scattering, Reflectors, Absorption spectrum, Backscattering.
Identifiers: *Air pollution detection, Mie scattering, *Remote sensing, Topographic features.

Remote pollutant measurement by absorption using topographical reflectors or atmospheric Mie scattering as a distributed reflector offers increased range and sensitivity compared to that achieved by Raman or resonance backscattering methods. The use of topographical reflectors offers the advantage of a single-ended absorption measurement for ranges up to 10 km and sensitivities to less than 0.01 ppm for a 10-mJ, 100-nsec transmitted pulse. The distributed Mie reflector permits absorption measurements and allows ranging by time-of-flight measurement. For a 100-mJ, 100-nsec pulse sensitivities to 0.3 ppm at a 15-m depth resolution to ranges of 1-4 km are possible. This sensitivity is 4 to 5 orders of magnitude better than that achieved by the Raman method. (Modified author abstract)

AD-767 188/6GA PC$4.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
CONSTRUCTION AND CALIBRATION OF A NEUTRAL GAS SPECTROMETER WITH OPEN CATHODELESS ELECTRON-IMPACT ION SOURCE FOR DENSITY MEASUREMENTS IN THE UPPER ATMOSPHERE,
H. Trinks. 17 May 73, 41p Rept nos. AFCRL-TR-73-0319, AFCRL-Trans-103
Trans. of Bundesministerium fuer Wissenschaftliche Forschung. Report (West Germany) BMBW-FB-W71-06.

Descriptors: (*Mass spectroscopy, Spectrum analyzers), (*Oxygen, Mass spectroscopy), Atoms, Ion sources, Calibration, Electron multipliers, Ultraviolet radiation, Cryopumping, Gas analysis, Upper atmosphere.
Identifiers: *Mass spectrometers, Oxygen atoms, Atmospheric composition, Translations.

Up to now, a reliable determination of the number density of atomic oxygen in the atmosphere by means of mass spectrometers has not been accomplished. Presumably, losses of O occur at the ion source walls and at the filament. Therefore, a mass spectrometer has been developed having an electron-impact ion source where the electrons are produced by a multiplier together with a UV lamp. To minimize the influence of impacts at the walls, the ion source was designed with a wide open geometry. The spectrometer was calibrated by means of a gas flow method with a gas flow of 50 liters/sec produced by a helium cooled cryopump. Neither oil nor mercury pumps were employed in the system. The calibration results are given, and the calculated mass discrimination curve is discussed and compared with that of a monopole spectrometer using an ion source with a hot filament. (Author)

AD-767 191/0GA PC$2.75/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
LASING FROM THE UPPER VIBRATIONAL LEVELS OF A FLASH-INITIATED H2-F2 LASER.
Rept. for May-Jul 72,
Steven N. Suchard. 15 Sep 73, 19p Rept no. TR-0074(4531)-1 SAMSO-TR-73-286
Contract F04701-73-C-0074

Descriptors: (*Fluorides, *Gas lasers), (*Fluorides, Chemiluminescence), Coherent radiation, Photolysis, Molecular energy levels, Infrared radiation, Hydrogen.
Identifiers: Molecular vibration, Molecular rotation, *Hydrogen fluoride lasers, Chemical lasers.

Lasing on the v = 6 to 5 and 5 to 4 vibration-rotation bands has been observed in the time-resolved spectral output of a He-diluted H2-F2 chain reaction chemical laser. The HF* lasing molecules were produced by the reaction of a 50-torr mixture of mole ratio H2/F2/He = 0.5/1/40 initiated by flash photolysis of the F2. Strong lasing was found from all P-branch vibration-rotation bands from v = 6 to 5 to 1 to 0. Within some bands, the time sequence of transitions suggests non-Boltzmann distributions of the rotational states. (Author)

AD-767 193/6GA PC$3.50/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
MEASUREMENT AND ANALYSIS OF THE HF RADIATION FROM A REACTING SUPERSONIC JET.
Rept. for Jan 71-Jan 72,
Munson A. Kwok. 15 Sep 73, 64p Rept no. TR-0074(4530)-3 SAMSO-TR-73-284
Contract F04701-73-C-0074

Descriptors: (*Gas lasers, Supersonic flow), (*Supersonic flow, Chemiluminescence), Gas flow, Quenching(Inhibition), Fluorides, Hydrogen compounds, Oxygen, Sulfur compounds, Spectra(Infrared), Hydrogen, Reaction kinetics, Combustion.
Identifiers: *Chemical lasers, *Hydrogen fluoride lasers, Emission spectra, Collisional energy transfer, Molecular vibration, Vibrational energy levels, *Hydrogen fluoride, Sulfur hexafluoride, Spectrum analysis, Jet flow.

The spontaneous emission from HF infrared bands in the free jet of a continuous HF chemical laser with a slit nozzle bank has been measured at a number of downstream positions. Three cases are reported: high-power flow (1) that includes O2, (2) without O2, and (3) with reduced SF6. Spatially averaged number densities of the HF vibrational levels (v = 1, 2, 3, 4) have been determined for the zero-power case. Vibrational nonequilibrium is evident. Observed rotational temperatures range from 560 down to 400 degrees K. Gain coefficients are deduced. Data have been fitted to both a one-dimensional, constant-pressure streamtube jet model and a two-dimensional model; the best fit occurs with the latter. Deactivation plays an important role in determining the average gain. The principal deactivator of HF(v) is H. Other important deactivation mechanisms are vibration-vibration transfers with HF or H2. (Modified author abstract)

AD-767 202/5GA Reprint
Florida Univ Gainesville
DISTORTED-WAVE CALCULATION OF ELECTRON-IMPACT EXCITATION OF ATOMIC OXYGEN,
T. Sawada, and P. S. Ganas. 8 Nov 72, 10p
AFOSR-TR-73-1880
Contract F44620-71-C-0012
Revision of report dated 22 Sep 72.
Availability: Pub. in Physical Review A, v7 n2 p617-626 Feb 73.

Descriptors: (*Oxygen, Electron transitions), Electron bombardment, Excitation, Atomic energy levels, Wave functions, Quantum mechanics, Gas ionization.
Identifiers: Born approximation, *Distorted wave approximation, Oxygen atoms, *Atom electron interactions, Cross sections.

A distorted-wave formulation with exchange is given for the electron-impact excitation of atoms using the LS-coupling scheme. Phenomenologically determined independent-particle models and distorted-wave potentials are utilized to compute angular distributions and integrated cross sections for 2p to 3s, 3p, and 4p excitations of atomic oxygen over wide ranges of energy and momentum transfer. The results are compared with the Born-approximation limit as well as the experimental integrated cross section of Stone and Zipf. (Modified author abstract)

AD-767 219/9GA PC$6.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
FEASIBILITY OF USING CONVERSION ELECTRON MOSSBAUER SPECTROSCOPY FOR CHARACTERIZATION OF SURFACES AND THIN FILMS,
Donald Gale Allen. Jun 73, 84p Rept no. GEP/PH/73-1

Descriptors: (*Mossbauer effect, *Films), Theses, Surface properties, Absorption, Iron, Detectors, Electrons, Nuclear spectroscopy, Fails, Experimental design.
Identifiers: Internal conversion, Electrostatic analyzers, Mossbauer spectroscopy.

Experimental techniques for the study of surfaces and thin films by the use of Mossbauer spectroscopy requires a detector that can isolate internal conversion electrons with energies of 7.3-keV or less. In addition, if the detector could 'energy-discriminate' the electrons, changes occurring in a thin film, as the interface between the film and substrate is approached, could be observed. An electrostatic detector, employing parallel deflector plates and a channeltron electron multiplier, was designed and constructed for the purpose of obtaining Mossbauer spectra by detecting specific-energy electrons. Although the detector was capable of detecting the 7.3-keV, 5.6-keV, and 0.53-keV electrons emitted in the decay of a Co57 point source, attempts to obtain Mossbauer spectra

were unsuccessful. A flowing-gas proportional counter, designed to detect internal conversion electrons, was used to obtain several Mossbauer spectra. Absorbers used for these spectra are discussed. (Modified author abstract)

AD-767 283/5GA PC$3.00/MF$1.45
Little (Arthur D) Inc Cambridge Mass
ELECTROCHEMICAL INTERACTION OF METALS WITH FLAME PLASMAS.
Final rept. Jun 72-Jun 73,
John M. Ketteringham, James D. Birkett, and Joan B. Berkowitz. Aug 73, 34p AROD-10160:1-MC
Contract DAHC04-72-C-0027

Descriptors: (*Nickel, Corrosion), (*Nickel alloys, Corrosion), (*Corrosion inhibition, Electric fields), (*Corrosion, *Flames), Surface properties, Sulfates, Polarization, Electron microscopy, Electrochemistry, Plasma medium.
Identifiers: Nichrome, Chemical reaction mechanisms.

Techniques have been developed to study the electrochemical interaction of metals and alloys with flame plasmas. Scanning electron microscopy showed that positive polarization of nickel in a sodium sulfate seeded propane air flame at 975C retards corrosion, whereas negative polarization accelerates corrosion. No such effect was observed for nickel at 1,075C or nichrome at either temperature. The impressed current density at these applied voltages is much less than the equivalent corrosion rate; this leads us to suggest that the mechanism involves the suppression or enhancement of the reduction of sulfate to sulfide (or sulfur) at the metal surface. Such reduced species are known to be responsible for accelerated hot corrosion of nickel alloys. (Author)

AD-767 286/8GA PC$2.75/MF$1.45
Louisiana State Univ New Orleans Dept of Chemistry
A STUDY OF GAS SOLID REACTIONS.
Final rept. 1 Apr 70-31 May 73,
George G. Guilbault. 27 Jun 73, 10p AROD-6964:11-C
Grant DA-ARO-D-31-124-70-G69

Descriptors: (*Air pollution, Gas detectors), (*Gas detectors, *Adsorption), Organic phosphorus compounds, Organic nitrogen compounds, Nitrates, Nitrogen oxides, Sulfur compounds, Oxides, Spectra(Infrared), Chemisorption, Piezoelectric crystals, Paramagnetic resonance, Transition elements, Salts.
Identifiers: Sulfur dioxide, Gas surface interactions, Air pollution detection.

The report summarizes a basic research study undertaken to find specific adsorbents for inorganic and organic gaseous pollutants present in the atmosphere. The basic reaction of chemical compounds (solids) with these pollutants (organophosphoric, organic nitrogen, SO2, NOx, nitrate) was studied using infrared spectroscopy and oscillating crystals. The nature of the interaction between the adsorbent and the pollutant was studied, and the interaction parameters studied. The most promising adsorbents for various classes of compounds were placed as coatings on the piezoelectric crystal detector, and the device was evaluated as a possible detector for the identification and assay of these compounds. The detector and each adsorbent were evaluated with respect to sensitivity and linearity of response, speed of response, accuracy of response, reversibility and limit of detection. Carbowax 20M was found to be a good adsorbent, for SO2 and the FeC13(-)organophosphate complex was good for organophosphorus compounds. A list of publications from the project is included. (Modified author abstract)

AD-767 346/0GA PC$2.75/MF$1.45
Naval Ammunition Depot Crane Ind
THE CHEMICAL REACTIVITY OF FERRIC OXIDE,
Charles A. Lipscomb, Jr. Jul 73, 24p Rept no. NAD-CR-RDTR-249

Descriptors: (*Iron oxides, Reduction(Chemistry)), Doping, Titanium, Heat of reaction, Pyrotechnics, Temperature, Enthalpy, Zirconium, Lithium, Synthesis(Chemistry), Ignition, Heat of combustion.
Identifiers: Thermodynamic properties, Chemical reactivity, Activation.

Ferric oxide may experience noticeable and sometimes drastic alterations in its physical properties and in the way it reacts chemically as well. This paper deals primarily with the effects of preparation temperature, selected impurities, and mechanical activation on such pyrotechnic properties as the heat of reaction and the preignition reaction temperature for the reaction: Fe2O3 + 3Ti to 3TiO + 2Fe. (Author)

AD-767 378/3GA PC$5.00/MF$1.45
Purdue Univ Lafayette Ind Project Squid Headquarters
RECENT PROGRESS IN CHEMI-IONIZATION KINETICS.
Technical rept.,
Arthur Fontijn. Sep 73, 59p Rept no. SQUID-TR-AC-13-PU
Contract N00014-67-A-0226-0005
Prepared by AeroChem Research Labs., Inc., Princeton, N.J. Report no. AeroChem-TP-296.

Descriptors: (*Gas ionization, Chemical reactions), Ions, Reviews, Reaction kinetics, Molecular energy levels, Excitation, Ionization, Ground state, Atomic energy levels.
Identifiers: Penning effect, Atom atom interactions, Atom molecule interactions, Rearrangement reactions, Collisional energy transfer.

A review of chemi-ionization reactions based on knowledge acquired since 1968 is given. Chemi-ionization reactions are considered to be: 'Reactions by which the number of elementary charge carriers is increased as the direct result of the information of new chemical bonds'. This includes both associative (A + B to AB(+) + e(-) and rearrangement (A + BC to AB(+) + C + e(-) ionization reactions. Rate coefficients for these reactions often decrease with increasing temperature (relative collision velocity). For a given reactant A the rate coefficients also tend to decrease with an increasing number of atoms in B. A number of examples of exoergic chemi-ionization reactions between ground state reactants have now been definitely established. More detailed knowledge of reactions involving an electronically excited collision partner has become available and meaningful comparisons to Penning ionization can be made. However, understanding of the details of the processes occurring are based primarily on observations of noble gas metastables, which, as is shown, do not in all respects apply to reactions of other species. (Modified author abstract)

AD-767 408/8GA Reprint
Yale Univ New Haven Conn Dept of Physics
HIGHER-ORDER RELATIVISTIC CONTRIBUTIONS TO THE COMBINED ZEEMAN AND MOTIONAL STARK EFFECTS IN POSITRONIUM,
Michael L. Lewis, and Vernon W. Hughes. 30 Jan 73, 16p AFOSR-TR-73-1874
Contract F44620-70-C-0091
Availability: Pub. in Physical Review A, v8 n2 p625-639 Aug 73.

Descriptors: (*Positronium, Atomic energy levels), Zeeman effect, Ground state, Excitation, Relativity theory, Hamiltonian, Stark effect, Line spectrum.

A calculation of higher-order relativistic contributions to the combined Zeeman and motional Stark effects in positronium is presented. These contributions are necessary for the determination of the fine-structure interval in the ground state from the Zeeman effect and may be important in future experiments on the first excited states of positronium. The contributions to the g(J) factors have been calculated for all the S states and for the 2P states. The energy levels and the higher-order corrections to the motional Stark effect in the first excited state are also presented. Relativistic contributions are obtained from the matrix elements of a Hamiltonian containing the Breit interaction, a Pauli Hamiltonian, and the virtual annihilation interaction. (Modified author abstract)

AD-767 409/6GA Reprint
Gulf Radiation Technology San Diego Calif
STUDY OF MOLECULAR HYDROGEN IONS PLUS HELIUM FORMING HELIUM HYDRIDE IONS PLUS ATOMIC HYDROGEN,
R. H. Neynaber, and G. D. Magnuson. 19 Feb 73, 9p Rept no. Gulf-RT-A12508 AFOSR-TR-73-1870
Contract F44620-70-C-0096
Availability: Pub. in the Jnl. of Chemical Physics, v59 n2 p825-831 Jul 73.

Descriptors: (*Hydrogen compounds, Chemical reactions), (*Helium, Chemical reactions), Molecular beams, Ground state, Ions, Ion beams, Molecular energy levels, Excitation, Hydrogen.
Identifiers: Atom ion interactions, Cross sections, Vibrational energy levels, Chemical reaction mechanisms, Atomic beams.

Laboratory-energy distributions of HeH(+) were measured for the reaction H2(+) + He to HeH(+) + H (endothermic by 0.81 eV for ground-state reactants and products) with a merging-beams apparatus over a range of interaction energy W from 0.05 to 12 eV. The He was in the ground state; the H2(+) was vibrationally excited. Absolute and relative cross sections were determined from these distributions. The role played by W and by the vibrational excitation of H2(+) in the formation of the peaks is discussed. It is not clear what mechanism controls the reaction. The data cannot be satisfactorily explained with either the spectator-stripping or the Langevin model. (Modified author abstract)

AD-767 410/4GA Reprint
Florida Univ Gainesville Engineering and Industrial Experiment Station
ELECTRON-IMPACT IONIZATION OF NE AND AR IN THE EIKONAL AND BORN APPROXIMATION,
Stephen Wallace, Richard A. Berg, and Alex E. S. Green. 21 Aug 72, 16p AFOSR-TR-73-1879
Contract F44620-71-C-0012
Revision of report dated 11 May 72.
Availability: Pub. in the Physical Review A, v7 n5 p1616-1629 May 73.

Descriptors: (*Neon, *Gas ionization), (*Argon, Gas ionization), Electron bombardment, Atomic structure, Approximation(Mathematics), Ionization.
Identifiers: Born approximation, *Eikonal approximation, Cross sections.

Utilizing the first Born approximation and an eikonal/closure approximation plus Bethe's generalized-oscillator strength (GOS) formalism, s- and p-shell ionization of Ne and Ar are evaluated. Partial-wave contributions to the GOS are calculated using an analytic independent-particle model (IPM) whose parameters have been established in previous work on excitation GOS's. For single ionization of Ne and Ar shells (K shell excepted), total cross sections and cross sections differential in the energy of the secondary electron are calculated for electron-impact energies near threshold to 10 keV. The eikonal/closure approximation which is developed in detail for large atoms differs from the Glauber theory by not assuming sudden passage of the projectile in which the time dependence of the bound electron and the energy

transfer to the projectile may be neglected. In the single-scattering limit, the theory produces a simple factor multiplying the usual Born approximation amplitude, which leads to improved agreement with experiment at low energy. (Author)

AD-767 412/0GA Reprint
Stanford Univ Calif Dept of Physics
GROUND-STATE ENERGY OF A DILUTE FERMI GAS,
R. F. Bishop. 15 Jun 72, 35p AFOSR-TR-73-1869
Contract F44620-71-C-0044
Availability: Pub. in Annals of Physics, v77 n1-2 p106-138, 1 May 73.

Descriptors: (*Fermions, Ground state), Quantum statistics, Green's function, Series.
Identifiers: *Fermi gas.

A large assembly of identical fermions interacting via a repulsive two-body potential is considered, and a series expression for the ground-state energy is developed. All terms preceding those dependent on parameters of three (or more)-particle scattering, are calculated. Two methods, using Goldstone and Feynman diagrams respectively, are developed simultaneously and are shown to form complementary techniques. Some formal properties of the exact Bethe-Goldstone equation in the case of the hard-core interaction, are developed in an appendix. (Modified author abstract)

AD-767 419/5GA PC$5.00/MF$1.45
TRW Systems Group Redondo Beach Calif
MONTE CARLO SIMULATION OF ION COLLECTION BY A ROCKET-BORNE MASS SPECTROMETER FOR COLLISIONLESS AND TRANSITIONAL FLOWFIELDS.
Final rept. (Part 2), 1 Jan-30 Jun 73,
Takashi Sugimura, and Frank W. Vogenitz. Jul 73, 57p Rept no. TRW-20982-6002-TU-00 AFCRL-TR-73-0448
Contract F19628-72-C-0130

Descriptors: (*Sampling, Ions), (*Mass spectroscopy, *Ionosphere), Flow fields, Monte Carlo method, Density, Knudsen number, Sounding rockets, Atmospheric sounding, Upper atmosphere.
Identifiers: Ion density(Concentration), Debye length, Ion molecule interactions.

Monte Carlo calculations of ion collection by a rocket-borne mass spectrometer have been completed for the collisionless case for the following range of parameters: Debye number 0.01 to 1000, speed ratio 0.1 to 3.1 and nondimensional potential -10 to -200. Calculations made in the transition regime show that minimum altitude at which the free molecule flow assumption is valid is approximately 120 km. A calculation at 70 km corresponding to a Knudsen number 0.007 indicates that the flowfield can be characterized as near-continuum but one in which the rarefaction effects are still important. The study demonstrates that the Monte Carlo technique is an efficient method to determine ion collection over the complete range of the flight parameters: Knudsen number, Debye number, plate potential, and speed ratio. (Modified author abstract)

AD-767 421/1GA Reprint
Texas Univ Austin
ELASTIC SCATTERING OF ELECTRONS BY H2 IN THE BORN APPROXIMATION,
A. Lewis Ford, and J. C. Browne. 27 Mar 73, 7p
Contract N00014-67-A-0126-0017
Prepared in cooperation with Harvard Coll. Observatory, Cambridge, Mass. Sponsored in part by National Science Foundation, Washington, D. C.
Availability: Pub. in Chemical Physics Letters, v20 n3 p284-290, 1 Jun 73.

Descriptors: (*Hydrogen, Elastic scattering), (*Elastic scattering, Numerical analysis), Approximation(Mathematics), Excitation, Electrons, Wave functions.
Identifiers: *Born approximation, Molecular vibration, Vibrational energy levels, Cross sections.

The paper presents accurate computation of the differential cross sections for the elastic and vibrational excitation of ground state H2 by fast electrons. The electronic matrix elements are evaluated at 20 internuclear separations and proper averaging over vibrational wavefunctions is carried out. The comparison to experiment yields excellent agreement. Different computational procedures appropriate for low and moderate values of momentum transfer are compared. (Author)

AD-767 422/9GA Reprint
Texas Univ Austin
DIRECT-RESOLVENT-OPERATOR COMPUTATIONS ON THE HYDROGEN-MOLECULE DYNAMIC POLARIZABILITY, RAYLEIGH, AND RAMAN SCATTERING,
A. Lewis Ford, and J. C. Browne. 31 Jul 72, 9p
Contract N00014-67-A-0126-0017
Prepared in cooperation with Harvard Coll. Observatory, Cambridge, Mass. Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in Physical Review A, v7 n2 p418-426 Feb 73.

Descriptors: (*Hydrogen, Scattering), Wave functions, Rayleigh scattering, Dipole moments, Polarization, Frequency, Numerical analysis.
Identifiers: Polarizability, Raman scattering, Cross sections.

Direct sum-over-states methods are used to evaluate the frequency-dependent polarizability and anisotropy for ground-state H2. Rayleigh and rotational and vibrational Raman cross sections for photon scattering and depolarization ratios are given for Lyman-alpha radiation. An assessment of the accuracy obtainable by the direct use of sum-over-states methods indicates its high promise as a technique for accurate computation of molecular properties. The Dalgarno-Epstein technique for obtaining a finite-set representation of components of the resolvent operator is shown to be effective for molecules. (Author)

AD-767 423/7GA Reprint
Texas Univ Austin
TRANSLATIONAL ABSORPTION OF HeH,
Bruce T. Ulrich, Lewis Ford, and J. C. Brown. 19 Jul 71, 5p
Contract N00014-67-A-0126-0017
Availability: Pub. in the Jnl. of Chemical Physics, v57 n7 p2906-2910, 1 Oct 72.

Descriptors: (*Hydrogen compounds, Absorption spectrum), (*Absorption spectrum, Kinetic energy), Molecular energy levels, Helium, Ground state, Dipole moments, Diatomic molecules, Numerical analysis, Spectra(Infrared).
Identifiers: *Translational absorption, Helium compounds.

There is reported here the calculation of the translational absorption spectrum of a system of a helium atom and a ground state hydrogen atom. We report also values of calculated potential curves for the ground state of the molecular system HeH and the dipole moment of the ground molecular state of HeH as a function of internuclear separation. The behavior of the dipole moment is of particular interest as it passes through zero at about R=7a(o). This change of sign follows from and correlates with the known long range behavior of the dipole moment of this system. (Author)

AD-767 424/5GA Reprint
Texas Univ Austin Dept of Physics
ADIABATIC REFERENCE FUNCTIONS AND CHEMICAL REACTIONS,
Edward J. Shipsey. 11 Dec 72, 5p
Contract N00014-67-A-0126-0017
Availability: Pub. in the Jnl. of Chemical Physics, v58 n12 p5368-5372, 15 Jun 73.

Descriptors: (*Chemical reactions, *Wave functions).
Identifiers: *Quantum chemistry.

An adiabatic differential equation describing chemical reaction is developed which allows convenient application of the reference function technique. The resulting equations are a generalization of Eu's equations for inelastic scattering. Some properties of these equations are discussed and a stationary principle derived for them. (Author)

AD-767 429/4GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
INCIDENT X-RAY ENERGY DEPENDENCE OF NEON COMPTON PROFILES.
Progress rept.,
Lawrence B. Mendelsohn, Benjamin J. Bloch, and Vedene H. Smith, Jr. 13 Jun 73, 6p
Contract N00014-67-A-0438-0011
Prepared in cooperation with Queen's Univ., Kingston (Ontario).
Availability: Pub. in Physical Review Letters, v31 n5 p266-269, 30 Jul 73.

Descriptors: (*Neon, *Compton scattering), X rays, Numerical analysis, Wave functions.
Identifiers: Compton cross sections.

Exact hydrogenic (EH) Compton-profile calculations have been performed for the L shell of neon. For the scattering of Mo K alpha and Ag K alpha radiation from neon the EH calculations show the Mo K alpha profile to lie higher at the center, in agreement with the experimental results of Eisenberger. An accurate configuration-interaction impulse Compton profile for neon is calculated and it is observed that the effect of correlation of J(O) is significantly smaller than reported earlier. (Author)

AD-767 430/2GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
VARIATIONAL PRINCIPLES FOR SINGLE-PARTICLE EXPECTATION VALUES IN THE HARTREE-FOCK APPROXIMATION.
Progress rept.,
V. Sahni, and J. B. Krieger. 19 Jan 73, 14p
Contract N00014-67-A-0438-0011
Availability: Pub. in Physical Review A, v8 n1 p65-76 Jul 73.

Descriptors: (*Atomic energy levels, *Hartree-Fock approximation), Wave functions, Helium, Hamiltonian.
Identifiers: Quantum chemistry.

The formalism developed by the authors for the variational determination of the expectation value of single-particle operators, via Delves's principle in the Hartree approximation is extended here to the Hartree-Fock approximation by employing a Slater-determinant-type trial wave function and an appropriately antisymmeterized auxiliary function. A set of coupled integral-differential equations for the components of the auxiliary function are obtained by a subsidiary variational minimization of a functional involving the trial wave function, the auxiliary function, the Hamiltonian, and the the operator. Owing to the antisymmetric nature of both the trial and auxiliary functions, an exchange term involving the specific single-particle operator in question appears in these equations. Decoupling approximations are discussed and the equation solved exactly for single-particle operators that depend on the radial distance only. Employing a single-parameter appropriately antisymmetrized product of the 1S and 2S hydrogenic functions as the trial wave function, the formalism in this Hartree-Fock approximation is then applied to both the helium isoelectronic sequences to obtain analytic expressions for the expectation value of the operators. (Modified author abstract)

AD-767 431/0GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics

K-SHELL COMPTON PROFILES AND INCOHERENT SCATTERING FACTORS.
Progress rept.,
Lawrence B. Mendelsohn, and Frank Biggs. Jan 73, 36p
Contract N00014-67-A-0438-0011
Prepared in cooperation with Sandia Labs., Albuquerque, N. Mex. Sponsored in part by Atomic Energy Commission, Washington, D.C.
Availability: Pub. in Proceedings of the International Conference on Inner Shell Ionization Phenomena and Future Applications held at Georgia Inst. of Tech., Atlanta, on 17-22 Apr 72. Conf-720404(V-2).

Descriptors: (*Compton scattering, Numerical analysis), Wave functions, X rays, Approximation(Mathematics), Scattering, Gas ionization.
Identifiers: *Compton profiles, Compton cross sections, Born approximation, Profiles.

Compton profiles are calculated for K-shell electrons within the Born approximation by use of nonrelativisitc 'exact' hydrogenic bound state and continuum wave functions. Impluse approximation profiles are also calculated. The integrated profiles (incoherent scattering factors) evaluated in the impulse approximation are extremely accurate over a wide range of incident photon energies, scattering angles, and binding energies. It is noted that L-shell exact and impulse hydrogenic Compton scattering profiles exhibit the same type of behavior as those for K-shell electrons. A frequently quoted result of F. Bloch that the center of the Compton profile is always shifted to higher energies (as compared to the energy of an outgoing photon scattered from a free electron at rest) is demonstrated by analysis of the 'exact' profile to be invalid. A constant in Bloch's energy defect result is corrected and the limitations of the result are discussed. (Modified author abstract)

AD-767 434/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
ABSOLUTE YIELDS OF X-RAY INDUCED PHOTOEMISSION FROM METALS,
John N. Bradford. 1972, 7p Rept no. AFCRL-TR-73-0549
Availability: Pub. in IEEE Transactions on Nuclear Science, vNS-19 n6 p167-171 Dec 72.

Descriptors: (*Photoelectric effect, X rays), Tantalum, Molybdenum, Copper, Aluminum.
Identifiers: Auger electrons, Electrostatic analyzers.

Absolute electron yields from tantalum, molybdenum, copper and aluminum have been measured for several x-ray bombarding geometries. The photon spectra used were derived from filtered bremsstrahlung generated in a tungsten anode at 50 KV, constant potential. The electron spectra were measured by a cylindrical electrostatic analyzer with a secondary emission detector. The spectra exhibit both Auger and scattered photoelectrons. (Author)

AD-767 461/7GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
RETARDATION IN TWO-ATOM SYSTEMS,
P. W. Milonni. 30 Jan 73, 5p AFOSR-TR-73-1724
Grant AF-AFOSR-1938-70
Revision of report dated 27 Oct 72.
Availability: Pub. in Optics Communications, v8 n1 p60-62 May 73.

Descriptors: (*Atomic energy levels, *Electron transitions), Electromagnetic fields, Relaxation time, Coherent radiation, Wave functions.
Identifiers: *Two level atoms, *Superradiance, Spontaneous emission.

The authors consider the old problem of two identical two-level atoms in a fixed distance r apart, one excited at t = 0, the other unexcited, and the field in the vacuum state. They are interested specifically in the higher order retardation effects, which have not previously been discussed. The existence is shown of an unexpected interference term in the probability for atom 1 to be excited which sets in two retardation times after atom 1 begins to decay. (Author)

AD-767 462/5GA Reprint
Georgia Univ Athens Dept of Physics and Astronomy
ELECTRON SPECTRA FROM COLLISIONS OF O(-) AND O WITH HELIUM,
Alan K. Edwards, and David L. Cunningham. 15 Jul 73, 7p AFOSR-TR-73-1875
Grant AF-AFOSR-2106-71
Availability: Pub. in Physical Review A, v8 n1 p168-173, Jul 73.

Descriptors: (*Oxygen, Electron transitions), Ionization, Atomic energy levels, Ions, Ion beams.
Identifiers: Atom ion interactions, Atom atom interactions, Electron spectrum, *Electron detachment.

Three new autodetaching states of O(-) have been found and an electron configuration has been assigned one of two previously observed transitions. This gives a total of five known autodetaching states of O(-). Transitions from these states appear as peaks in the spectrum of electrons produced in collisions of O(-) ions with a helium target. The electron spectrum produced by collisions of netural O with helium shows four autoionizing series of oxygen lying just above the first ionization potential. (Modified author abstract)

AD-767 477/3GA PC$3.25/MF$1.45
Sussex Univ Brighton (England)
COMPUTER ANALYSIS OF THERMO CHEMICAL DATA. CATCH TABLES. HALOGEN COMPOUNDS,
J. D. Cox, J. B. Pedley, A. Kirk, S. Seilman, and L. G. Heath. Sep 72, 24p AFOSR-TR-73-1738
Grant AF-AFOSR-2220-72

Descriptors: (*Halogen compounds, *Heat of reaction), Enthalpy, Heat of formation, Molecular weight, Thermodynamics, Great Britain, Chemical reactions, Fluorides, Chlorides, Bromides, Iodides, Chlorates, Iodates, Bromine compounds, Fluorine compounds, Chlorine compounds, Iodine compounds, Data, Thermochemistry.
Identifiers: Thermochemical properties, Bromates.

The report lists molecular weights, enthalpies of formation, and associated uncertainties for halogen compounds of hydrogen, oxygen, rare gases, and other halogens, and corresponding hydrates. It also contains enthalpies of reactions of these compounds.

AD-767 490/6GA Reprint
California Univ Berkeley Coll of Engineering
ABSORPTION PROCESSES ASSOCIATED WITH ANTI-STOKES FLUORESCENCE IN RHODAMINE B SOLUTIONS,
R. K. Jain, C. Hu, T. K. Gustafson, S. S. Elliot, and M. S. Chang. 5 Sep 72, 6p AFOSR-TR-73-1892
Contract F44620-71-C-0087
Revision of report dated 9 Feb 72.
Availability: Pub. in Jnl. of Applied Physics, v44 n7 p3157-3161 Jul 73.

Descriptors: (*Dyes, *Absorption), Fluorescence, Impurities, Cooling, Chemical reactions.
Identifiers: *Rhodamine B, Quantum efficiency, Dimerization, *Antis-tokes emission, Radiative energy transfer, Xanthene dyes.

The absorption coefficient of several rhodamine B solutions excited at 632.8 nm has been measured for temperatures ranging from 200 to 385K. The weak monomer absorption coefficient at this anti-Stokes excitation wavelength facilitates a study of the other components of absorption in the dye solution, yielding valuable information on solvent effects and factors affecting the quantum efficiency of fluorescence, such as dimer absorption, impurity content, etc. Whereas at high temperatures (above 30C), linear singlet-singlet monomer absorption is observed to dominate, dimer formation is evident at temperatures below 30C, and the impurity absorption appears negligible in either case. The associating energy for the dimer is found to be 5.0 kcal/mole. It also seems possible that at temperatures above 50C, for solutions with low impurity absorption, quantum efficiencies high enough for radiative cooling of the solution may be attained. (Modified author abstract)

AD-767 514/3GA Reprint
Ohio State Univ Columbus Dept of Chemistry
THEORETICAL STUDIES OF INELASTIC ATOMIC COLLISIONS IN A TWO-STATE MODEL PROBLEM,
H. Nakamura. 26 Sep 72, 28p AFOSR-TR-73-1736
Grant AF-AFOSR-2272-72
Availability: Pub. in Molecular Physics, v25 n3 p577-602 1973.

Descriptors: (*Inelastic scattering, Atoms), Saddle point method, Matrix algebra, Potential scattering.
Identifiers: *Atom atom interactions, Cross sections, Glory scattering.

A two-state scattering problem in which two noncrossing Morse curves are coupled by an exponential potential is discussed theoretically in both the diabatic and adiabatic approximations. Inelastic cross sections are estimated by various approximate analytical formulas, which are expressed in terms of the distorted wave matrix elements. The Landau (steepest descent) method is applied to estimate the distorted wave matrix element. The oscillation of the transition probability as a function of angular momentum of relative motion is well reproduced by the adiabatic approximation. A glory effect in the velocity dependence of the cross section is found in the low energy region, and the adiabatic approximation reproduces this undulation phenomenon well. (Author)

AD-767 517/6GA Reprint
Washington Univ St Louis Mo Dept of Physics
EXACT CLOSED FORM SOLUTIONS AND PHOTON STATISTICS OF COHERENT SPONTANEOUS EMISSION IN A CAVITY,
M. E. Smithers, and E. Y. C. Lu. 8 May 73, 4p AFOSR-TR-73-1773
Contract F44620-69-C-0121
Availability: Pub. in Physics Letters, v44A n5 p355-356, 2 Jul 73.

Descriptors: (*Atomic energy levels, *Electron transitions), Coherent radiation, Wave functions.
Identifiers: *Superradiance, *Two level atoms, Dicke state, Spontaneous emission.

Exact closed form solutions are obtained for the coherent spontaneous emission by a large number of two-level atoms in a Dicke state. Depending on the initial states of the atoms, three types of photon statistics are obtained for the emitted radiation field. Possible implications for recent experimental results are discussed. (Author)

AD-767 518/4GA Reprint
Washington Univ Seattle Dept of Chemistry
ACCURATE EVALUATION OF INTERNAL ENERGY LEVEL SUMS AND DENSITIES INCLUDING ANHARMONIC OSCILLATORS AND HINDERED ROTORS,
Stephen E. Stein, and B. S. Rabinovitch. 27 Sep 72, 10p AFOSR-TR-73-1735
Contract F44620-70-C-0012
Availability: Pub. in Jnl. of Chemical Physics, v58 n6 p2438-2445, 15 Mar 73.

Descriptors: (*Molecular energy levels, Mathematical analysis), Density.

Identifiers: Addition, Harmonic oscillators(Quantum mechanics), Anharmonic oscillators.

The calculation of molecular energy level sums and densities is necessary for the treatment of many physical and chemical problems including reaction rates. An extension of Beyer and Swinehart's algorithm for directly computing harmonic oscillator eigenstate sums and densities is described. With this new algorithm it is possible to compute exact or near-exact energy level sums and densities for degrees of freedom such as free and hindered rotors and anharmonic oscillators so long as the energy levels for each degree of freedom can be specified. Computer calculation by this technique is practical even for large molecules up to all chemically interesting energies and error is confined to small rounding errors. Results by this algorithm are compared to values of energy level sums that have been given in the literature by various alternative approximate treatments. (Modified author abstract)

AD-767 519/2GA Reprint
Missouri Univ Rolla Dept of Physics
PROPERTIES OF MICROWAVE CAVITIES CONTAINING A MAGNETIC RESONANT SAMPLES,
Kathy A. Rages, Robert E. Sawyer, and Edward B. Hale. 23 Mar 73, 6p AFOSR-TR-73-1661
Grant AF-AFOSR-2108-71
Revision of report dated 27 Nov 72.
Availability: Pub. in Reviews of Scientific Instruments, v44 n7 p830-834 Jul 73.

Descriptors: (*Microwave equipment, Cavity resonators), (*Cavity resonators, Physical properties), Electron spin resonance, Dielectric properties, Resonant frequency, Magnetic properties, Laboratory equipment.
Identifiers: Cavities, Performance evaluation.

Properties of TE(011) cylindrical, microwave cavities containing cylindrical samples of various radii and dielectric constants are calculated. The properties considered are the resonant frequency, quality factor, relevant magnetic filling factor for spin transitions, and a signal sensitivity factor for a lossless sample. Sample sizes range from zero radius to full cavity radius with some experimental data on less than full length samples. The choice of dielectric constants range from one to sixteen. The data is presented in dimensionless form since it will be of use to other spin resonant investigators. It is shown that use of large samples is undesirable even if they are lossless. (Modified author abstract)

AD-767 572/1GA PC$8.25/MF$1.45
California Inst of Tech Pasadena Dept of Electrical Engineering
REACTION KINETICS OF PD AND TI-AL FILMS ON SI,
Robert W. Bower. May 73, 125p Rept no. Scientific-1 AFCRL-TR-73-0389
Contract F19628-73-C-0174

Descriptors: (*Palladium, Films), (*Titanium alloys, Films), (*Aluminum alloys, Films), Silicon, Backscattering, Reaction kinetics, Crystal growth, X-ray diffraction analysis, Integrated circuits, Phase studies, Substrates, Intermetallic compounds, Silicides, Palladium compounds, Crystal structure, Chemical reactions.

The growth of compound phases from thin film layers of Pd and Ti-Al deposited on Si is described in this work. The growth kinetics and composition of the compound phases were measured utilizing 2 MeV 4He backscattering. Crystalline structure and film texture effects of the compounds layers were measured by X-ray diffraction techniques. The Ti-Al metal system is used to make contact to Si in integrated circuit applications. Compound phases in this system can be directly related to severe erosion of metal -Si contact areas which result in failure of the integrated circuits. The rate kinetics are found to have practical application in predicting and controlling a failure mechanism in an integrated circuit metallization scheme. (Modified author abstract)

AD-767 627/3GA PC$3.00/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
THE PERMEABILITY OF POLYMERS TO GASES, VAPOURS AND LIQUIDS.
Technical rept.,
R. W. Richards. Mar 73, 34p* Rept no. ERDE-TR-135 DRIC-BR-35756

Descriptors: (*Polymers, *Permeability), Pressure, Films, Temperature, Diffusion, Diffusivity, Gases, Liquids, Measurement, Vapors, Membranes, Thickness, Reviews, Physical properties, Great Britain.
Identifiers: Polymer gas permeability.

The review covers the theories and relationships describing the permeability of polymers to gases, vapours and liquids. The effects of temperature and film thickness are described and various methods of measuring permeability are discussed. (Modified author abstract)

AD-767 632/3GA PC$2.75/MF$1.45
Department of Commerce Washington D C
THE INFRARED SPECTRA OF MATRIX ISOLATED URANIUM OXIDE SPECIES.
Annual progress rept.,
S. Abramowitz, and N. Acquista. 9 Aug 73, 25p DNA-3145T

Descriptors: (*Uranium compounds, *Spectra(Infrared)), Oxides, Molecular energy levels, Isotopes.
Identifiers: *Uranium oxides, Matrix isolation techniques, Spectrum analysis, Oxygen isotopes.

The infrared spectra of matrix isolated products of the interaction of uranium and oxygen have been investigated at high temperatures. By use of collateral, available data on the various uranium oxide species, plus employment of oxygen 16 and 18 isotopes, peak assignments were verified for many of the neutral metal oxide species. (Author)

AECL-4434/GA PC$7.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
CHEMISTRY AND MATERIALS DIVISION. PROGRESS REPORT, OCTOBER 1--DECEMBER 31, 1972.
Jan 73, 115p PR-CMa-23
U.S. Sales Only.

Descriptors: (*Chemistry, *Research programs), Chemical analysis, Electron microscopy, Ion beams, Molecules, Nuclear physics.

For abstract, see NSA 28 02, number 02089.

BDX-613-859(Rev.)/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
SOLUBILITY PARAMETER TECHNOLOGY AND EVAPORATIVE RATE ANALYSIS USED TO EVALUATE CONTAMINANTS.
L. C. Jackson. May 73, 7p
Contract AT(29-1)-613

Descriptors: (*Hydrocarbons, *Radiochemical analysis), (*Organic chlorine compounds, Radiochemical analysis), (*Esters, Radiochemical analysis), (*Ethers, Radiochemical analysis), Alcohols, Amines, Carbon 14 compounds, Evaporation, Ketones, Pollution, Solids, Solubility, Surfaces.

For abstract, see NSA 28 03, number 05187.

BNL-17677/GA PC$5.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
COMPUTER-CONTROLLED DATA ACQUISITION SYSTEM FOR AUTOMATED AMINO-ACID ANALYSIS.
C. P. Hohberger, B. Soucek, R. L. Chase, and D. Potter. Feb 73, 56p
Contract AT(30-1)-16

Descriptors: (*Data acquisition systems, *Ion exchange chromatography), (*Amino acids, Ion exchange chromatography), (*Computer codes, *B codes), Recording systems, Sampling.

For abstract, see NSA 28 03, number 07626.

BNL-17772/GA PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
LEAST MOTION ANALYSIS OF REACTION PATHWAYS.
S. Ehrenson. 1973, 36p CONF-730418-1

Descriptors: (*Chemical reactions, *Functional models), (*Methane, Chemical reactions), (*Hydrogen, Chemical reactions), (*Protons, Chemical reactions), Stereochemistry, Atoms, Dimerization, Methylene radicals.

For abstract, see NSA 28 03, number 07664.

CEA-CONF-2172/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
APPRECIATION OF LINEAR FLUORESCENCE TO THE STUDY OF PIGMENTS IN MONOMOLECULAR LAYERS.
J. Breton, M. Michel-Villaz, G. Paillotin, and M. Vandevyver. 1972, 9p CONF-720568-3
In French. U.S. Sales Only.

Descriptors: (*Pigments, *Fluorescence spectroscopy), Chlorophyll, Layers.

For abstract, see NSA 28 03, number 07671.

CEA-CONF-2193/GA PC$3.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
HYDROGEN ADSORPTION ON NI (100).
J. Lapujoulade, and K. S. Neil. 10 Jul 72, 25p CONF-720679-1
U.S. Sales Only.

Descriptors: (*Nickel, *Surfaces), (*Hydrogen, *Adsorption), Chemisorption, Crystal structure, Enthalpy, Medium temperature, Temperature dependence.

For abstract, see NSA 28 02, number 05007.

CEA-CONF-2195/GA PC$3.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
PRESENT STATUS OF MULTIPHOTON EXCITATION AND IONIZATION OF ATOMS.
G. Mainfray, and C. Manus. 5 Apr 72, 23p CONF-720558-2
U.S. Sales Only.

Descriptors: (*Photon collisions, *Excitation), (*Atoms, Photon collisions), Alkali metals, Excited states, Field theories, Hydrogen, Ionization, Perturbation theory, Probability, Rare gases, Resonance, Reviews.

For abstract, see NSA 28 02, number 03748.

CEA-CONF-2228/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
SPECTRA OF THE AMMONIATED ELECTRON IN THE PRESENCE OF AMIDE.
E. Saito. 10p CONF-720681-3
U.S. Sales Only.

Descriptors: (*Solvated electrons, *Infrared spectra), (*Ammonia, *Photolysis), Amides, Radiolysis.

For abstract, see NSA 28 02, number 02327.

CEA-CONF-2249/GA PC$3.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
MULTIPHOTON IONIZATION OF RARE GASES AND ATOMIC HYDROGEN.
G. Mainfray. 3 Aug 72, 25p CONF-720976-3
U.S. Sales Only.

Descriptors: (*Photon collisions, *Reviews), (*Rare gases, Photon collisions), (*Hydrogen, Photon collisions), Atoms, Ionization.

For abstract, see NSA 28 02, number 03749.

CEA-R-4350/GA PC$4.50/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
LIQUID--LIQUID EXTRACTION: TRANSIENT REGION STUDIES. EFFECT OF HYDRODYNAMICS ON THE OPERATION OF THE EQUIPMENT.
J. M. Demarthe. Feb 73, 49p
In French. U.S. Sales Only.

Descriptors: (*Mixer-settlers, *Operation), Flow models, Hydrodynamics, Solvent extraction.

For abstract, see NSA 28 02, number 02231.

COM-73-11491/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
LIQUID CRYSTALS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 73,
Edward J. Lehmann. Jul 73, 136p* NTIS-WIN-73-035
Supersedes NTIS-PK-67.

Descriptors: (*Liquid crystals, *Bibliographies), Optical properties, Display systems, Phase transformations.

The NTISearch bibliography contains 132 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Included are studies on the applications and the physical, chemical, and optical properties of liquid crystals. (Author)

COM-73-11507/3GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
THERMAL ENERGY REACTIONS OF NEGATIVE IONS WITH H ATOMS IN THE GAS PHASE,
F. C. Fehsenfeld, Carleton J. Howard, and E. E. Ferguson. 19 Feb 73, 3p NOAA-73082907
Pub. in Jnl. of Chemical Physics, v58 n12 p5841-5842, 15 Jun 73.

Descriptors: (*Hydrogen, Dissociation), (*Hydrogenation, Anions), Gases, Electric heating elements, Anions, Reaction kinetics, Afterglows.
Identifiers: Atom ion interactions.

The report concerns thermal energy reactions of negative ions with H atoms. It briefly describes an experimental innovation which consisted of the substitution of hot filament thermal dissociation of H2 to produce atomic hydrogen rather than the microwave discharged dissociation used previously. The rate constants thus obtained are tabulated. Comparison with previously determined absolute rate constants is used to place the present rate constants on an absolute scale that is believed to be reliable to within a factor of 2.

COM-73-11511/5GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
THERMAL ENERGY CHARGE TRANSFER OF NE(+) WITH VIBRATIONAL EXCITED N2,
D. L. Albritton, Y. A. Bush, F. C. Fehsenfeld, E. E. Ferguson, and T. R. Govers. 22 Jan 73, 3p NOAA-73080904
Sponsored in part by Defense Nuclear Agency, Washington, D.C.
Pub. in Jnl. of Chemical Physics, v58 n9 p4036-4037, 1 May 73.

Descriptors: (*Nitrogen, Gas ionization), (*Gas ionization, Molecular vibration), Afterglows, Reaction kinetics, Cations, Neon, Excitation.
Identifiers: *Ion molecule interactions, *Charge exchange reactions, Vibrational energy levels, *Collisional energy transfer.

This note indicates that the authors have found an ion-molecule thermal energy charge transfer reaction that has a drastic increase in rate constant with increased neutral molecule vibrational temperature. Experimental data were obtained in the same flowing afterglow system and with the same techniques as their earlier studies on the reaction O(+) + N2 goes to NO(+) + N as a function of N2 vibrational temperature. The criteria for efficient thermal energy charge transfer have not yet been firmly elucidated.

COM-73-50733/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE REALIZATION OF LOW TEMPERATURE FIXED POINTS ON THE NBS ACOUSTICAL AND THE NBS-1955 TEMPERATURE SCALES.
Final rept.,
George Cataland, and H. H. Plumb. 1971, 11p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th) Washington, D.C., 21-24 Jun 71. v4 pt1 p183-193.

Descriptors: (*Hydrogen, Boiling points), (*Temperature measurement, Standards).

The normal boiling and triple points of equilibrium hydrogen have been realized and related to the NBS (1955) temperature scale. From isotherms that were determined with the NBS acoustical thermometer, values of Tbacoustical) can be associated with the above fixed points and also with the normal boiling point.

COM-73-50745/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ANALYSIS OF THE PRESSURE VIRIALS AND CLAUSIUS-MOSSOTTI FUNCTION FOR POLYATOMIC GASES.
Interim rept. Oct-Dec 72,
James F. Ely, H. J. M. Hanley, and G. C. Straty. 1973, 7p
Pub. in Jnl. of Chemical Physics, v59 n2 p842-848, 15 Jul 73.

Descriptors: (*Polyatomic molecules, *Equations of state), (*Statistical mechanics, Polyatomic molecules), Gases, Quadrupole moment, Nitrogen, Fluorine, Dielectric properties, Pressure.
Identifiers: *Virial coefficients, Polarizability, Potential functions, Clausius-Mossotti function.

Statistical mechanical equations for the second pressure virial coefficient and the second and third dielectric virial coefficients for quadrupolar molecules are evaluated using the m-6-8 potential function. The results are compared with experimental data for nitrogen and fluorine. An approximate value for the quadrupole moment of fluorine is estimated. Agreement between theory and experiment is generally good.

COM-73-50797/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
GAMMA RAY SPECTROSCOPY.
Final rept.,
Philip D. LaFleur, and Barbara A. Thompson. 1973, 2p
Pub. in Encyclopedia of Chemistry, 3rd ed., 1973, p1032-1033.

Descriptors: (*Gamma ray spectroscopy, Technical reports).

The article was prepared for the third edition of the Encyclopedia of Chemistry. It is a revision of an article which appeared in the previous edition, published by Reinhold Publishing Company in 1966.

COM-73-50800/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SYSTEMATIC TRENDS AND ATOMIC OSCILLATOR STRENGTHS.
Final rept.,
M. W. Smith, G. A. Martin, and W. L. Wiese. 1973, 8p
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Pub. in Nuclear Instruments and Methods (Netherlands) v110 p219-226 1973.

Descriptors: (*Atomic energy levels, Excitation), Trends, Electron transitions, Atomic beams, Atomic spectra.
Identifiers: *Oscillator strengths.

A number of newly established or significantly improved systematic trends of atomic oscillator strengths in isoelectronic sequences and spectral series are presented. For most of these trends, beam-foil experiments have played a prominent role in supplying critically needed points. Of particular interest are the changes in several transitions of the Be and C sequences brought about by improved beam-foil results and more refined theoretical calculations. Also of significance are newly detected trends in the Li and Al isoelectronic sequences. An example will be given where the analysis of the f-value dependence along a sequence, coupled with an understanding of the changes in the energy level structure, points out areas where future beam-foil experiments would be desirable in clearing up discrepancies. The n(*3) dependence of oscillator strengths for perturbed series will be illustrated with another interested example.

COM-73-50802/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
HAMILTONIAN, SYMMETRY GROUP, AND VIBRATIONAL COORDINATES FOR THE NONRIGID MOLECULE CXY2-CC-CXY2.
Final rept.,
G. Dellepiane, M. Gussoni, and J. T. Hougen. 1973, 16p
Pub. in Jnl. of Molecular Spectroscopy, v47 n3 p515-530 Sep 73.

Descriptors: (*Alkyne compounds, Hamiltonian functions), Molecular vibration, Molecular structure, Symmetry, Molecular rotation, Torsion.
Identifiers: Rotation(Chemical bonds).

A vibration-torsion-rotation Hamiltonian * is derived for a molecule of the type CXY2-CC-CXY2 exhibiting nearly free internal rotation. The Hamiltonian obtained preserves many of the features of the ordinary Wilson-Howard vibration-rotation Hamiltonian and is based qualitatively on the idea of a slowly varying torsional reference configuration from which the atoms make rapid vibrational displacements. The appropriate molecular symmetry group for this molecule is found to be a double group of the simple Longuet-Higgins permutation-inversion symmetry group. The indeterminacy of symmetry species (single-valued vs double-valued) for coordinates used to describe the small amplitude vibrations is illustrated and clarified using a simple model for the skeletal bending vibrations.

COM-73-50804/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INFRARED SPECTRA OF CS2: MEASUREMENT OF 'HOT' BANDS ASSOCIATED WITH THE 2325/CM AND 2962/CM BANDS.
Final rept.,
Arthur G. Maki. 1973, 9p
Pub. in Jnl. of Molecular Spectroscopy, v47 n2 p217-225 Aug 73.

Descriptors: (*Carbon disulfide, *Infrared spectra), Molecular vibration, Molecular rotation, Ground state.
Identifiers: *Vibrational energy levels, *Hot bands.

Transitions of CS2 have been measured. 'Hot' bands associated with these transitions were also measured. Improved rotational constants are given for the ground state and the first bending state. A consistent set of band constants is given for all the above vibrational transitions.

COM-73-50814/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A METHOD FOR THE MEASUREMENT OF SMOKE AND HC EVOLUTION FROM POLY (VINYL CHLORIDE).
J. J. Comeford, and M. Birky. 1972, 6p
Pub. in Fire Technol. v8 n2 p85-90 May 72.

Descriptors: (*Polyvinyl chloride, Pyrolysis), (*Combustion products, Polyvinyl chloride), Measurement, Hydrogen chloride, Smoke, Evolution(Liberation).

As poly (vinyl chloride) becomes more popular as a building material and electrical insulation, it becomes more important to life safety to determine its smoke and hydrogen chloride evolution characteristics during pyrolysis. The authors have devised a method of measuring the two simultaneously.

COM-73-50817/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MICROWAVE SPECTRA OF CARBONYL SULFIDE: MEASUREMENTS OF GROUND STATE AND VIBRATIONALLY EXCITED (16)O(13)C(32)S,(18)O(12)C(32)S, AND OTHER ISOTOPIC SPECIES.
Final Rept.,
Arthur G. Maki, and Donald R. Johnson. 1973, 8p
Pub. in Jnl. of Molecular Spectroscopy, v47 n2 p226-233 Aug 73.

Descriptors: (*Carbonyl compounds, *Microwave spectra), (*Inorganic sulfides, Microwave spectra), Ground state, Molecular energy levels, Carbon isotopes, Oxygen isotopes, Sulfur isotopes, Molecular rotation, Molecular vibration, Excitation.
Identifiers: *Carbonyl sulfide, Vibrational energy levels.

Microwave measurements have been made on isotopically enriched samples of 13C-carbonyl sulfide and 18O-carbonyl sulfide. Centrifugal distortion constants and l-type doubling constants have been determined for these isotopically substituted molecules. Rotational constants have been measured for all vibrational states below 2150/cm and Be values have been determined. The equilibrium bond distances calculated from different pairs of isotopes are compared and a subsitution equilibrium structure is given. Some new measurements are also reported for the isotopic species (18)O(13)C(32)S,(18)O(13)C(34)S, (18)O(12)C(34)S and (16)O(13)C(34)S.

COM-73-50818/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MICROWAVE SPECTRA OF D2(17O) AND D2(18O).
Final rept.,
Jean Bellet, Walter J. Lafferty, and Guy Steenbeckeliers. 1973, 15p
Pub. in Jnl. of Molecular Spectroscopy, v47 n3 p388-402 Sep 73.

Descriptors: (*Heavy water, *Microwave specta), Oxygen isotopes, Molecular rotation, Hyperfine structure, Centrifugal force.

Forty lines of the microwave specta of D2(17O) and D2(18O) have been measured in the region from 8 to 400 GHz and analyzed according to Watson's centrifugal distortion theory. Comparision of the results obtained for D2(16O), D2(17O), D2(18O) demonstrates their internal consistency. The transferability of the parameters according to the isotopic substitution rules is evidence for the validity of the model chosen for the study of the ground state of heavy water. The effective rotational constants deduced from the observed spectra are very close to the values calculated using Oka's second order theory. The hyperfine structure of the D2(17O)lines has been analyzed using as a reference the corresponding quadrupole coupling tensor of HD(17O) with the appropriate rotation.

COM-73-50819/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
LOW FREQUENCY RAMAN-ACTIVE LATTICE VIBRATIONS OF N-PARAFFINS.
Final rept.,
Heinz G. Olf, and Bruno Fanconi. 1973, 11p
Pub. in Jnl. of Chemical Physics, v59 n1 p534-544, 1 Jul 73.

Descriptors: (*Alkanes, *Raman spectra), (*Lattice vibrations, Alkanes), Crystal structure, Crystal lattices, Phonons, Orthorhombic lattices, Triclinic lattices.

Raman spectra in the frequency range 5-200/cm have been measured for a series of crystalline n-paraffins from n-C5H12 to n-C26H54 and also n-C32H66, n-C35H72, and n-C35H74. It is found that the spectral data may be grouped consonant with crystal structures exhibited by n-paraffins. The data are used to map out portions of the transverse acoustical phonon dispersion curves of the orthorhombic polyethylenelike lattice and of one triclinic crystalline form. A band whose frequency is independent of chain length is observed for the orthorhombic n-paraffins and is assigned to the B3g rotatory lattice mode of polyethylene.

COM-73-50820/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INELASTIC NEUTRON SCATTERING STUDY OF THE 'ROTATOR' PHASE TRANSITION IN N-NONADECANE.
Final rept.,
John D. Barnes. 1973, 9p
Pub. in Jnl. of Chemical Physics, v58 n12 p5193-5201, 15 Jun 73.

Descriptors: (*Alkanes, *Neutron scattering), Elastic scattering, Inelastic scattering, Mathematical models.
Identifiers: *Nonadecanes, Molecular dynamics.

A simple kinematic model for rotational jump diffusion of a normal alkane about its long axis (circular random walk model) is developed. Inelastic neutron scattering data obtained on the Fermi chopper time-of-flight instrument using an incident neutron wavelength of 2.47 A are compared with the predictions of the model. Data taken below the temperature of the 'rotator' phase transition in n-nonadecane (295K) show no quasielastic scattering due to diffusive motions. Data taken in n-nonadecane in its disordered solid phase show quasielastic scattering consistent with the circular random walk model. Estimates for values of the model parameters are obtained.

COM-73-50824/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ONE-ELECTRON SPECTRUM OF SINGLY IONIZED YTTERBIUM (YB II).
Final rept.,
V. Kaufman, and J. Sugar. 1973, 5p
Pub. in Jnl. of the Optical Society of America, v63 n9 p1168-1172 Sep 73.

Descriptors: (*Ytterbium, Atomic spectra), Atomic energy levels, Ultraviolet spectra, Gas ionization.

The spectrum produced by a hollow cathode discharge was measured from 2107 A to 1377 A. With these new data and the previously published observations of Yb II, the following new (4f)14nl series terms were found: 10s, 7p, 7-11d, 5-14f, and 5-6g. A value of 98269(50)/cm was deduced for the ionization energy.

COM-73-50826/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ZEEMAN EFFECT AND REVISED ANALYSIS OF SINGLY IONIZED RUBIDIUM (RB II).
Final rept.,
Joseph Reader, and Gabriel Epstein. 1973, 15p
Pub. in Jnl. of the Optical Society of America, v63 n9 p1153-1167 Sep 73.

Descriptors: (*Rubidium, Atomic energy levels), Zeeman effect, Atomic spectra, Gas Ionization.

The spectrum of Rb II has been observed in a sliding spark discharge with the NBS 10.7-m normal-incidence vacuum spectrograph and in an electrodeless discharge with the NBS 10.7 m Eagle spectrograph in air. The Zeeman effect was observed from 2200 to 5200 A with an electrodeless lamp in a magnetic field of 31,000 G. The analysis has confirmed all ten of the previously known levels of the (4p)5(5p) configuration. Other (4p)5 configurations have been considerably revised and extended. All configurations have been theoretically interpreted, with configuration interaction included. The energy parameters determined from a least-square fit to the observed level values are compared with Hartree-Fock calculations. The ionization energy is derived.

COM-73-50827/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ADSORPTION AND DECOMPOSITION OF FORMALDEHYDE ON TUNGSTEN (100) AND (111) CRYSTAL PLANES.
Final rept.,
John T. Yates, Jr., Theodore E. Madey, and Miles J. Dresser. 1973, 16p
Pub. in Jnl. of Catalysis, v30 n2 p260-275 Aug 73.

Descriptors: (*Formaldehyde, *Chemisorption), (*Tungsten, Chemisorption), Methane, Desorption, Crystal structure, Catalysis, Carbon monoxide, Carbon dioxide, Hydrogen, Dissociation.
Identifiers: Atomic hydrogen.

The chemisorption of formaldehyde at 100 K has been investigated on two single crystal planes of tungsten, W(100) and W(111). At low H2CO coverages, only H2 and CO are observed as thermal desorption products. At higher H2CO coverages both CH4, and CO2 are observed as additional desorption products. Work function and flash desorption measurements indicate that the dissociative adsorption of H2CO into H(ads) and CO(ads) is accompanied at higher surface coverages by the formation of other surface complexes. A detailed comparison of W(100) with W(111) indicates that crystallographic differences play a minor role in the surface catalyzed decomposition of H2CO by tungsten.

CONF-721010-53/GA PC$3.00/MF$1.45
Metropolitan Museum of ART, New York (Usa).
DETERMINATION OF MAJOR COMPONENTS AND TRACE ELEMENTS IN ANCIENT SILVER

BY THERMAL NEUTRON ACTIVATION ANALYSIS.
P. Meyers, L. van Zelst, and E. V. Sayre. 1972, 13p

Descriptors: (*Silver, *Activation analysis), (*Copper, Activation analysis), (*Gold, Activation analysis), (*Sodium, Activation analysis), Accuracy, Antimony, Archaeology, Arsenic, Bromine, Chromium, Cobalt, Copper iodides, Gamma spectroscopy, Iridium, Iron, Isotopic exchange, Manganese, Mercury, Multi-element analysis, Multi-element separation, Neutron reactions, Potassium, Quantitative chemical analysis, Sampling, Scandium, Selenium, Sensitivity, Silver iodides, Thermal neutrons, Trace amounts, Zinc.

For abstract, see NSA 28 03, number 05090.

CONF-721010-65/GA PC$3.00/MF$1.45
Technische Universitaet, Munich (West Germany). Institut fuer Radiochemie.
THERMAL AND EPITHERMAL NEUTRON ACTIVATION ANALYSIS USING THE MONOSTANDARD METHOD.
A. Alian, H. J. Born, and J. I. Kim. 1972, 13p
U.S. Sales Only.

Descriptors: (*Scandium, *Activation analysis), (*Iron, Activation analysis), (*Cobalt, Activation analysis), (*Rubidium, Activation analysis), Accuracy, Antimony, Barium, Basalt, Calibration, Calibration standards, Cerium, Cesium, Cross sections, Epithermal neutrons, Europium, Granites, Hafnium, Irradiation procedures, Lanthanum, Neutron beams, Quantitative chemical analysis, Resonance integrals, Sensitivity, Tantalum, Terbium, Thermal neutrons, Thorium.

For abstract, see NSA 28 02, number 02096.

CONF-721010-66/GA PC$3.00/MF$1.45
APPLICATION OF PARTITION CHROMATOGRAPHY TO ACTIVATION ANALYSIS.
I. P. Alimarin, Yu. V. Yakovlev, and O. V. Stepanets. 1972, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Yttrium, *Activation analysis), (*Manganese, Activation analysis), (*Zinc, Activation analysis), (*Cadmium, Activation analysis), Chromatography, Cobalt, Copper, Impurities, Iron, Mercury, Multi-element analysis, Multi-element separation, Niobium, Silver, Quantitative chemical analysis, Molybdenum, Zirconium, Beryllium.

For abstract, see NSA 28 02, number 02097.

CONF-721010-67/GA PC$3.00/MF$1.45
ACTIVATION ANALYSIS OF SUBSTANCES HAVING LARGE NEUTRON CAPTURE CROSS SECTIONS.
I. P. Alimarin, Yu. V. Yakovlev, and N. N. Dogadkin. 1972, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Boron, *Activation analysis), (*Cadmium, Activation analysis), Accuracy, Impurities, Neutron beams, Quantitative chemical analysis, Self-shielding.

For abstract, see NSA 28 02, number 02098.

CONF-721010-73/GA PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
ANALYSIS OF PRECISION OF ACTIVATION ANALYSIS METHODS.
K. Heydorn, and K. Noergard. 1972, 10p
U.S. Sales Only.

Descriptors: (*Manganese, Activation analysis), (*Activation analysis, *Sensitivity), (*Blood serum, Activation analysis), Accuracy, Counting techniques, Errors, Poisson equation, Probability, Quantitative chemical analysis, Sample preparation, Statistics.

For abstract, see NSA 28 02, number 02103.

CONF-721010-74/GA PC$3.25/MF$1.45
APPLICATION OF COMPUTERS TO THE CHOICE OF AN OPTIMUM ACTIVATION ANALYSIS METHOD AND TO THE AUTOMATIC PROCESSING OF THE DATA.
I. N. Ivanov. 1972, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Activation analysis, *Computer calculations), Data processing, Gamma spectra, Neutron beams, Programming.

For abstract, see NSA 28 02, number 02104.

CONF-721010-75/GA PC$3.00/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
QUALITATIVE AND QUANTITATIVE INTERPRETATION OF GAMMA -RAY SPECTRA IN ACTIVATION ANALYSIS.
P. J. M. Korthoven. 1972, 11p
U.S. Sales Only.

Descriptors: (*Activation analysis, *Gamma spectra), Accuracy, Automation, Comparative evaluations, Computer calculations, Data processing, Energy spectra, Peaks, Programming.

For abstract, see NSA 28 02, number 02105.

CONF-721010-77/GA PC$3.00/MF$1.45
Max-Planck-Institut fuer Metallforschung, Stuttgart (West Germany). Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Radiochemie.
ACTIVATION ANALYSIS WITH FAST NEUTRONS USING A CYCLOTRON.
V. Krivan, and H. Muenzel. 1972, 11p
U.S. Sales Only.

Descriptors: (*Activation analysis, *Fast neutrons), Atomic number, Excitation functions, Irradiation procedures, Mev range 10-100, Neutron beams, Nuclear reactions, Sensitivity, Targets.

For abstract, see NSA 28 02, number 02107.

CONF-721010-78/GA PC$3.00/MF$1.45
Nippon Telegraph and Telephone Public Corp., Tokai (Japan). Ibaraki Electrical Communication Lab.
SUBSTOICHIOMETRIC DETERMINATION OF TRACE IMPURITIES IN HIGH-PURITY MATERIALS BY RADIOACTIVATION ANALYSIS.
K. Kudo, T. Shigematsu, and H. Iso. 1972, 8p
U.S. Sales Only.

Descriptors: (*Arsenic alloys, *Activation analysis), (*Gallium alloys, Activation analysis), (*Nickel, Activation analysis), (*Manganese, Activation analysis), Cadmium, Copper, Gold, Impurities, Intermetallic compounds, Multi-element analysis, Multi-element separation, Neutron reactions, Quantitative chemical analysis, Selenium, Silver, Solvent extraction, Substoichiometry, Thermal neutrons, Zinc.

For abstract, see NSA 28 03, number 05091.

CONF-721010-81/GA PC$3.00/MF$1.45
Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center.
DETERMINATION OF RARE EARTHS BY HIGH RESOLUTION X-RAY SPECTROMETRY FOLLOWING NEUTRON ACTIVATION.
M. Mantel, and S. Amiel. 1972, 14p
U.S. Sales Only.

Descriptors: (*Rare earths, *Activation analysis), Accuracy, Errors, Minerals, Neutron beams, Quantitative chemical analysis, Sensitivity, Thermal neutrons, X-ray spectroscopy.

For abstract, see NSA 28 02, number 02110.

CONF-721010-86/GA PC$3.75/MF$1.45
ACTIVATION ANALYSIS USING RESONANCE NEUTRONS AND POLARIZED PARTICLES.
A. S. Shtan. 1972, 31p
In Russian. U.S. Sales Only.

Descriptors: Activation analysis, Neutron beams, Polarization, Resonance, Sensitivity.

For abstract, see NSA 28 02, number 02115.

CONF-721010-87/GA PC$3.00/MF$1.45
Pavia Univ. (Italy).
RADIOANALYTICAL INVESTIGATION ON RHODIUM EXTRACTION BEHAVIOR WITH TRI-N-BUTYLPHOSPHATE FROM IODIDE SOLUTIONS.
R. Stella, and M. Di Casa. 1972, 13p
U.S. Sales Only.

Descriptors: (*Rhodium, *Activation analysis), Iodides, Neutron beams, Quantitative chemical analysis, Sensitivity, Solvent extraction, Tbp, Thermal neutrons.

For abstract, see NSA 28 02, number 02116.

CONF-721010-88/GA PC$3.00/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
AUTOMATED CHEMICAL SEPARATIONS IN ROUTINE ACTIVATION ANALYSIS.
P. S. Tjioe, J. J. M. de Goeij, and J. P. W. Houtman. 1972, 16p
U.S. Sales Only.

Descriptors: (*Arsenic, *Activation analysis), (*Antimony, Activation analysis), (*Cadmium, Activation analysis), (*Copper, Activation analysis), Accuracy, Automation, Biological materials, Distillation, Interfering elements, Ion exchange chromatography, Mercury, Multi-element separation, Neutron beams, Quantitative chemical analysis, Selenium, Sensitivity, Thermal neutrons, Zinc.

For abstract, see NSA 28 02, number 02117.

CONF-721010-89/GA PC$3.00/MF$1.45
Philips Gloeilampenfabrieken N. V., Eindhoven (Netherlands). Forschungslaboratorium.
OVERALL INSTRUMENTAL THERMAL NEUTRON ACTIVATION ANALYSIS OF HIGH PURITY MATERIALS.
M. L. Verheijke, and J. C. Verplanke. 1972, 8p
U.S. Sales Only.

Descriptors: Activation analysis, Data processing, Gamma spectra, Half-life, Impurities, Li-drifted ge detectors, Neutron beams, Peaks, Programming, Quantitative chemical apalysis, Semiconductor materials, Thermal neutrons, Trace amounts.

For abstract, see NSA 28 02, number 02118.

CONF-721069-31/GA PC$3.00/MF$1.45
Nippon Telegraph and Telephone Public Corp., Tokai (Japan). Ibaraki Electrical Communication Lab. Tohoku Univ., Sendai (Japan).
APPLICATION OF SUBSTOICHIOMETRY TO RADIOACTIVATION ANALYSIS. DETERMINATION OF TRACE IMPURITIES IN HIGH-PURITY MATERIALS.
K. Kudo, and N. Suzuki. 1972, 10p
U.S. Sales Only.

Descriptors: (*Semiconductor materials, *Activation analysis), (*Metals, Activation analysis), Accuracy, Corrections, Errors, Impurities, Multi-element analysis, Multi-element separation, Neutron reactions, Sensitivity, Substoichiometry, Thermal neutrons.

For abstract, see NSA 28 03, number 05092.

CONF-721069-33/GA PC$3.00/MF$1.45
Institute of Physical and Chemical Research, Wako (Japan).
IMPURITY BEHAVIOR OF LIGHT ELEMENTS IN SI USED FOR MANUFACTURING SEMICONDUCTOR MATERIALS.
T. Nozaki, Y. Yatsurugi, N. Akiyama, Y. Endo, and Y. Makide. 1972, 11p
In French. U.S. Sales Only.

Descriptors: (*Carbon, *Absorption spectroscopy), (*Nitrogen, Absorption spectroscopy), (*Oxygen, Absorption spectroscopy), (*Silicon, *Activation analysis), Accuracy, Distribution, Impurities, Infrared spectra, Quantitative chemical analysis, Semiconductor materials, Sensitivity, Tracer techniques.

For abstract, see NSA 28 03, number 05093.

CONF-721069-35/GA PC$3.00/MF$1.45
Research Inst. For Telecommunication, Budapest (Hungary).
ACTIVATION ANALYSIS OF IMPURITY DISTRIBUTIONS IN CRITICAL LAYERS OF SEMICONDUCTORS.
H. Rausch, T. Bereznai, and J. Bogancs. 1972, 7p
U.S. Sales Only.

Descriptors: (*Gold, *Activation analysis), (*Copper, Activation analysis), (*Sodium, Activation analysis), (*Arsenic, Activation analysis), Antimony, Autoradiography, Crystal growth, Depth, Distribution, Doped materials, Epitaxy, Etching, Impurities, Interfaces, Neutron beams, Phosphorus, Quantitative chemical analysis, Semiconductor materials, Sensitivity, Silicon, Substrates, Surfaces, Thermal neutrons.

For abstract, see NSA 28 03, number 05094.

CONF-721069-49/GA PC$3.00/MF$1.45
Slovak Technical Univ., Bratislava (Czechoslovakia). Dept. Of Radiochemistry and Radiation Chemistry.
SOME RESULTS OBTAINED IN SLOVAKIA IN THE DETERMINATION OF TRACE ELEMENTS BY NEUTRON ACTIVATION ANALYSIS.
J. Tolgyessy, A. Adamek, V. Kliment, F. Severa, and J. Sacha. 1972, 11p
U.S. Sales Only.

Descriptors: (*Activation analysis, *Reviews), Czechoslovakia, Mev range 10-100, Neutron beams, Thermal neutrons, Trace amounts.

For abstract, see NSA 28 03, number 05095.

CONF-730317-2/GA PC$4.50/MF$1.45
Oak Ridge National Lab., Tenn.
DEVELOPMENT OF AN ANALYTICAL SYSTEM BASED AROUND A MINIATURE FAST ANALYZER.
C. A. Burtis, W. F. Johnson, J. C. Mailen, J. B. Overton, and T. O. Tiffany. 1973, 50p

Descriptors: (*Chemical analysis, *Laboratory equipment).

For abstract, see NSA 28 03, number 07682.

CONF-730402-(P1-2)/GA PC$27.20/MF$1.45
Arizona State Univ., Tempe.
PROCEEDINGS OF THE TENTH RARE EARTH RESEARCH CONFERENCE, CAREFREE, ARIZONA, APRIL 30--MAY 3, 1973.
C. J. Kevane, and T. Moeller. 1973, 1229p
In English and French.

Descriptors: (*Rare earths, *Meetings), Proceedings.

For abstract, see NSA 28 03, number 06200.

CONF-730616-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ADSORPTION ON ZIRCONIUM OXIDE.
H. F. Holmes, E. L. Jr. Fuller, and R. A. Beh. 1972, 18p

Descriptors: (*Zirconium oxides, *Sorptive properties), (*Nitrogen, *Chemisorption), (*Argon, Chemisorption), (*Water, Chemisorption), High temperature, Losses, Low pressure, Medium temperature, Porosity, Surface properties, Weight.

For abstract, see NSA 28 03, number 06129.

COO-1082-39/GA PC$3.00/MF$1.45
Wisconsin Univ., Madison. Dept. Of Chemistry.
STUDIES OF ION EXCHANGE MEMBRANES AND FLOWTHROUGH ELECTRODES APPLIED TO CONTINUOUS ANALYSIS. FINAL REPORT.
W. J. Blaedel. 15 Apr 73, 6p
Contract AT(11-1)-1082

Descriptors: (*Electrodes, *On-line systems), Chemical analysis, Fluid flow.

For abstract, see NSA 28 02, number 05013.

COO-1515-38/GA PC$3.75/MF$1.45
Wisconsin Univ., Madison.
SELECTIVE SORPTION OF TRACE AMOUNTS OF CALCIUM AND STRONTIUM BY HYDROUS OXIDES OF IRON AND ALUMINUM.
D. G. Kinniburgh, M. L. Jackson, and J. K. Syers. 1973, 34p

Descriptors: (*Calcium, *Adsorption), (*Strontium, Adsorption), Aluminium oxides, Gels, Iron oxides, Separation processes, Trace amounts.

For abstract, see NSA 28 03, number 05216.

COO-1515-42/GA PC$3.50/MF$1.45
Wisconsin Univ., Madison. Dept. Of Soil Science.
FIXING CATION INTERACTION WITH BLISTER-LIKE OSMOTIC SWELLING ON VERMICULITE CLEAVAGES.
K. Sridhar, and M. L. Jackson. 1972, 30p

Descriptors: (*Vermiculite, *Shrinkage), (*Cesium, *Ion exchange), (*Rubidium, Ion exchange), (*Potassium, Ion exchange), Ammonium compounds, Cations, Cleavage, Sodium, Swelling.

For abstract, see NSA 28 02, number 02233.

COO-1515-46/GA PC$3.75/MF$1.45
Wisconsin Univ., Madison.
IRON OXIDATION AND REDUCTION EFFECTS ON STRUCTURAL HYDROXYL AND LAYER CHARGE IN AQUEOUS SUSPENSIONS OF BIOTITIC VERMICULITES.
J. A. Veith, and M. L. Jackson. 1972, 31p

Descriptors: (*Iron, *Oxidation), Biotite, Layers, Reduction, Vermiculite.

For abstract, see NSA 28 03, number 07696.

COO-1515-47/GA PC$3.00/MF$1.45
Wisconsin Univ., Madison.
EXCHANGE OF LYOTROPIC SERIES CATIONS BY MICACEOUS VERMICULITE AND ITS WEATHERING PRODUCTS DETERMINED BY ELECTRON MICROSCOPY AND RADIOCHEMICAL ANALYSIS. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
M. L. Jackson. 1973, 20p
Contract AT(11-1)-1515

Descriptors: (*Vermiculite, *Sorptive properties), (*Lithium, *Ion exchange), (*Sodium, Ion exchange), (*Beryllium, Ion exchange), Ammonium compounds, Calcium, Cesium, Magnesium, Potassium, Rubidium, Soils, Strontium, Swelling.

For abstract, see NSA 28 03, number 05217.

COO-1680-18/GA PC$3.00/MF$1.45
Iowa State Univ. Of Science and Technology, Ames.
EXCHANGE OF INTERLAYER CATIONS IN MICACEOUS MINERALS. PROGRESS REPORT, FEBRUARY 1, 1972--JULY 31, 1973.
A. D. Scott. 1973, 4p
Contract AT(11-1)-1680

Descriptors: (*Cesium, *Ion exchange), (*Mica, Ion exchange), Cations, Layers, Potassium, Research programs, Rubidium.

For abstract, see NSA 28 03, number 07698.

COO-1680-19/GA PC$3.50/MF$1.45
Iowa State Univ. Of Science and Technology, Ames.
EXCHANGE OF INTERLAYER CATIONS IN MICACEOUS MINERALS. SUMMARY REPORT, FEBRUARY 1, 1970--JULY 31, 1973.
A. D. Scott. 1973, 27p
Contract AT(11-1)-1680

Descriptors: (*Cesium, *Ion exchange), (*Rubidium, Ion exchange), (*Potassium, Ion exchange), (*Mica, Ion exchange), Cations, Layers, Research programs.

For abstract, see NSA 28 03, number 07699.

COO-2092-22/GA PC$3.25/MF$1.45
Chicago Univ., Ill.
INTERMOLECULAR POTENTIALS OF SYMMETRIC RARE GAS PAIRS FROM ELASTIC DIFFERENTIAL CROSS SECTION MEASUREMENTS.
J. M. Farrar, T. P. Schafer, and Y. T. Lee. 1972, 24p CONF-730104-1

Descriptors: (*Helium, *Atom collisions), (*Neon, Atom collisions), (*Argon, Atom collisions), (*Krypton, Atom collisions), Colliding beams, Differential cross sections, Elastic scattering, Intermolecular forces, Xenon.

For abstract, see NSA 28 02, number 03750.

COO-3027-6/GA PC$10.75/MF$1.45
Columbia Univ., New York. Liquid Metals Research Lab.
POOL BOILING AND CONDENSATION OF ELEMENTAL SELENIUM.
L. Breitstein, and C. F. Bonilla. 1971, 173p
Contract AT(11-1)-3027

Descriptors: (*Selenium, *Heat transfer), High temperature, Low pressure, Medium pressure, Pool boiling, Vapor condensation.

For abstract, see NSA 28 02, number 05016.

COO-3028-3/GA PC$3.50/MF$1.45
Princeton Univ., N. J. Dept. Of Chemical Engineering.

EFFECTS OF SURFACE-ACTIVE MATERIALS ON THE OSCILLATIONS OF A LIQUID JET.
G. P. Quinn, and D. A. Saville. 1972, 27p
Contract AT(11-1)-3028

Descriptors: (*Jets, *Oscillations), Boundary layers, Damping, Interfaces, Liquids, Molecules, Stability, Surface tension, Surfactants, Viscosity.

For abstract, see NSA 28 03, number 07705.

FRNC-CONF-71/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires. Paris Univ., Orsay (France). Laboratoire de l'Accelerateur Lineaire. Orleans Univ. (France).
ANALYSIS OF THE CHEMICAL COMPOSITION OF FLUID INCLUSIONS BY NEUTRON ACTIVATION.
N. Deschamps, C. Sabouraud, I. N. Bourrelly, J. C. Touray, and M. Treuil. 1972, 4p CONF-721069-43
In French. U.S. Sales Only.

Descriptors: (*Chlorine, *Activation analysis), (*Bromine, Activation analysis), (*Gypsum, Activation analysis), Gamma spectroscopy, Geochemistry, Neutron beams, Seas, Separation processes, Thermal neutrons.

For abstract, see NSA 28 02, number 02120.

FRNC-CONF-74/GA PC$3.00/MF$1.45
Ugine-Kuhlmann, Levallois-Perret (France). Laboratoire Central de Recherches Produits Chimiques.
DETERMINATION OF AS, SE, AND TE IN S.
J. L. Verot, and J. J. Jaumier. 1972, 5p CONF-721069-20
In French. U.S. Sales Only.

Descriptors: (*Arsenic, *Activation analysis), (*Selenium, Activation analysis), (*Tellurium, Activation analysis), (*Sulfur, Activation analysis), Accuracy, Gamma spectroscopy, Multi-element analysis, Multi-element separation, Neutron beams, Quantitative chemical analysis, Sensitivity, Thermal neutrons, Trace amounts.

For abstract, see NSA 28 03, number 05098.

FRNC-TH-314/GA PC$7.00/MF$1.45
Lyon Univ. (France).
STUDY OF ION EXCHANGE EQUILIBRIA IN WATER-HEXAMETHYLPHOSPHOROTRIAMIDE (HMPT) MEDIA. APPLICATION TO THE SEPARATION OF RARE EARTHS.
J. L. Imbert. 1971, 97p
In French. U.S. Sales Only.

Descriptors: (*Rare earths, *Ion exchange), Amides, Anions, Cadmium, Cations, Cobalt, Equilibrium, Hydrochloric acid, Iron, Nitric acid, Organic ion exchangers, Organic phosphorus compounds, Separation processes, Temperature dependence, Water, Zinc.

For abstract, see NSA 28 02, number 02234.

FRNC-TH-315/GA PC$8.75/MF$1.45
Lyon Univ. (France).
ISOTOPIC EFFECTS WITH EXP 14 C: NATURE OF THE TRANSITION STATE IN VARIOUS CASES OF PHENYL MIGRATION.
J. Laureillard. 1972, 133p
In French. U.S. Sales Only.

Descriptors: (*Carbon 14, *Isotope effects), Alcohols, Binding energy, Chemical reaction kinetics, Dioxane, Hydrolysis, Molecular structure, Organic bromine compounds, Sodium hydroxides, Solvolysis, Stereochemistry, Water.

For abstract, see NSA 28 03, number 05257.

GAT-T-2040/Ths/GA PC$5.50/MF$1.45
Goodyear Atomic Corp., Piketon, Ohio.
TERNARY VAPOR--LIQUID EQUILIBRIA PREDICTED FROM THE BINARY SYSTEM DATA UF SUB 6 --HF, UF SUB 6 --F114, HF--F114.
R. J. Slough. 2 Apr 73, 68p
Contract AT(33-2)-1

Descriptors: (*Uranium hexafluoride, *Chemical analysis), Errors, Freons, Hydrofluoric acid, Impurities, Liquids, Sampling, Vapors.

For abstract, see NSA 28 03, number 05138.

GEPP-105/GA PC$3.25/MF$1.45
General Electric CO., St. Petersburg, Fla. Neutron Devices Dept.
NONDESTRUCTIVE DETERMINATION OF AREAL DENSITY AND TRITIUM CONTENT OF TRITIDED ERBIUM FILMS USING BETA EXCITED X RAYS.
J. E. Pearson. 25 May 73, 22p
Contract AT(29-2)-656

Descriptors: (*Erbium, *Chemical analysis), (*Tritium, *X-ray spectroscopy), Accuracy, Beta decay, Density, Errors, Films, Quantitative chemical analysis, Tritium compounds.

For abstract, see NSA 28 03, number 05190.

IS-3101/GA PC$3.00/MF$1.45
Ames Lab., Iowa.
MODIFICATION AND OPERATION OF A KNUDSEN EFFUSION APPARATUS.
B. H. Justice. Mar 73, 15p
Contract W-7405-eng-82

Descriptors: (*Magnesium, *Vapor pressure), Alkaline earth metals, Gas flow, Knudsen flow, Rare earth alloys, Thermodynamics.

For abstract, see NSA 28 03, number 07717.

JEN-253/GA PC$5.00/MF$1.45
Junta de Energia Nuclear, Madrid (Spain). Division de Quimica.
APPLICATIONS OF THE GAS CHROMATOGRAPHY IN THE NUCLEAR SCIENCE AND TECHNOLOGY.
L. Gasco Sanchez. 1972, 56p
In Spanish. U.S. Sales Only.

Descriptors: (*Gas chromatography, *Reviews), (*Isotope separation, Gas chromatography), (*Labelled compounds, *Chemical preparation), Fuel cycle, Gases, Metals, Radiation chemistry, Separation processes, Uses.

For abstract, see NSA 28 03, number 05364.

JINR-P2-6996/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
INFRARED SINGULARITIES AND HYPERFINE SPLITTING IN POSITRONIUM.
N. E. Nyun'ko, Yu. N. Tyukhtyaev, and R. N. Faustov. 1973, 14p
In Russian. U.S. Sales Only.

Descriptors: (*Positronium, *Hyperfine structure), Energy, Energy levels, Infrared radiation, Mass, Quantum field theory, Singularity.

For abstract, see NSA 28 02, number 03745.

JUL-915-RW/GA PC$5.50/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorwerkstoffe.
CONTRIBUTION TO IDENTIFY PYROLYSIS BY-PRODUCTS IN SOOT OF A FLUIDIZED BED AND IN PYROCARBON.
E. Wolfrum, J. Rottmann, I. Bueker, and H. Nickel. Jan 73, 67p
In German. U.S. Sales Only.

Descriptors: (*Pyrolytic carbon, *Chemical preparation), (*Hydrocarbons, *Pyrolysis), Acetylene, Coated fuel particles, Fluidized bed, Gas chromatography, Mass spectroscopy, Propylene, Separation processes.

For abstract, see NSA 28 02, number 02274.

LBL-1675/GA PC$3.50/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
MOESSBAUER ISOMER SHIFTS OF THE 6.2-KEV GAMMA RAYS OF TANTALUM-181.
G. Kaindl, D. Salomon, and G. Wortmann. Apr 73, 27p CONF-730117-3
Contract W-7405-eng-48

Descriptors: (*Tantalum 181, *Energy-level transitions), (*Transition elements, *Isomer shift), Gamma spectra, Moessbauer effect, Nuclear radii.

For abstract, see NSA 28 02, number 04166.

LFEN-NL-75-a/GA PC$4.50/MF$1.45
Junta de Energia Nuclear, Sacavem (Portugal). Laboratorio de Fisica E Engenharia Nucleares.
FORTRAN SUBPROGRAMS FOR THE DETERMINATION OF SEVERAL PHYSICAL PROPERTIES OF WATER AND OF AIR.
J. Mota, and J. Brazao. 1972, 46p
In Portuguese. U.S. Sales Only.

Descriptors: (*Air, *Physical properties), (*Water, Physical properties), Computer codes, Fortran.

For abstract, see NSA 28 02, number 05044.

N-73-11730/GA PC$4.00/MF$1.45
Pittsburgh Univ., PA. Dept. Of Physics.
EXCITATION OF ATOMIC NITROGEN BY ELECTRON IMPACT.
E. J. Stone, and E. C. Zipf. Oct 72, 34p NASA-CR-129087
Contract DA-31-124-ARO(D)-440

Descriptors: (*Earth atmosphere, *Nitrogen), (*Electron collisions, *Excitation), Atoms, Branching ratio, Cross sections, Distribution, Molecules, Multiplets, Resonance, Spectra.

For abstract, see NSA 28 02, number 03751.

NIM-1108/GA PC$3.25/MF$1.45
National Inst. For Metallurgy, Johannesburg (South Africa).
INTERFERENCES RELATING TO THE DETERMINATION OF THE NOBLE METALS BY ATOMIC-ABSORPTION SPECTROPHOTOMETRY.
R. C. Mallett, D. C. G. Pearton, E. J. Ring, and T. W. Steele. 9 Oct 70, 24p
U.S. Sales Only.

Descriptors: (*Palladium, *Absorption spectroscopy), (*Rhodium, Absorption spectroscopy), Interfering elements, Lanthanum, Uranium, Vanadium, Osmium, Iridium, Gold.

For abstract, see NSA 28 03, number 07743.

NIM-1414/GA PC$4.50/MF$1.45
National Inst. For Metallurgy, Johannesburg (South Africa).
USE OF A CLOSED RECIRCULATION APPARATUS IN THE STUDY OF THE GALENA--OXYGEN--XANTHATE SYSTEM.
P. J. Harris, and N. P. Finkelstein. 30 Jan 73, 46p
U.S. Sales Only.

Descriptors: (*Galena, *Chemical reactions), (*Oxygen, Chemical reactions), (*Xanthates, Chemical reactions), Adsorption, Chemical reaction kinetics, Organic sulfur compounds, Quantity ratio.

For abstract, see NSA 28 03, number 07744.

NIM-961/GA PC$3.00/MF$1.45
National Inst. For Metallurgy, Johannesburg (South Africa).
PREPARATION OF STANDARD SOLUTIONS FOR THE PLATINUM-GROUP METALS AND GOLD. LABORATORY PREPARATION METHOD NO. 6.
R. Robert, and T. W. Steele. 12 May 70, 4p
U.S. Sales Only.

Descriptors: (*Platinum, *Sample preparation), (*Palladium, Sample preparation), (*Gold, Sample preparation), (*Rhodium, Sample preparation), Iridium, Osmium, Ruthenium, Solutions, Specifications.

For abstract, see NSA 28 02, number 05045.

NP-19726/GA PC$3.00/MF$1.45
Scientific Research Inst. Of Electro-Physical Apparatus, Leningrad (Ussr).
ANALYSIS OF MOLECULAR FLOW DISTRIBUTION IN HIGH-VACUUM SORPTION STRUCTURES. PREPRINT A-0167.
L. S. Gurevich, and G. L. Saksaganskii. 1972, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Fluid flow, *Vacuum systems), Adsorption, Cylindrical configuration, Distribution, Molecules, Motion, Wall effect.

For abstract, see NSA 28 03, number 07746.

NP-19740/GA PC$3.50/MF$1.45
Jyvaskyla Univ. (Finland). Dept. Of Physics.
TRANSPORT EFFICIENCY OF THE HELIUM-JET RECOIL-TRANSPORT METHOD WITH PURE HELIUM.
J. Aysto, and K. Valli. Feb 73, 28p
U.S. Sales Only.

Descriptors: Atoms, Efficiency, Helium, Jets, Recoils.

For abstract, see NSA 28 03, number 05355.

N73-27089/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CONVERSATIONAL HIGH RESOLUTION MASS SPECTROGRAPHIC DATA REDUCTION.
M. P. Romiez. Aug 73, 41p NASA-TM-X-2847, A-4875

Descriptors: *Computer programs, *Data reduction, *Mass spectrometers, Fortran, Mass spectra, Time sharing.

For abstract, see STAR 1118

N73-27609/9GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OPTICAL POTENTIAL APPROACH TO THE ELECTRON-ATOM IMPACT IONIZATION THRESHOLD PROBLEM.
A. Temkin, and Y. Hahn. Jul 73, 55p NASA-TM-X-66282, X-641-73-195
Subm-Submitted for Publication.

Descriptors: *Atomic excitations, *Electron impact, *Ionization, *Scattering cross sections, Approximation, Extrapolation, Ionization potentials, S matrix theory, Schroedinger equation.

For abstract, see STAR 1118

N73-27696/6GA PC$3.50/MF$1.45
Institut fuer Chemie der Treibstoffe, Berghausen (West Germany).
CONVERGENCE IMPROVEMENT FOR THE CALCULATION OF EQUILIBRIUM SYSTEMS USING THE NEWTON-RAPHSON METHOD VERBESSERUNG DER KONVERGENZ BEI DER BERECHNUNG VON GLEICHGEWICHTSSYSTEMEN NACH DEM NEWTON-RAPHSON-VERFAHREN.
H. Bathelt. 15 Dec 72, 27p ICT-3/72
Language in German.

Descriptors: *Chemical equilibrium, *Convergence, *Gas mixtures, *Methylhydrazine, *Newton-raphson method, Carbon, Fluorine, Hydrogen, Iterative solution, Nitrogen, Nozzle flow.

For abstract, see STAR 1118

N73-27805/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
THERMODYNAMIC AND TRANSPORT PROPERTIES OF GASEOUS TETRAFLUOROMETHANE IN CHEMICAL EQUILIBRIUM.
J. L. Hunt, and L. R. Boney. Aug 73, 107p NASA-TN-D-7181, L-8483

Descriptors: *Chemical equilibrium, *Fluorine compounds, *Methane, *Thermodynamic properties, *Transport properties, Computer programs, Graphs (Charts), Tables (Data).

For abstract, see STAR 1118

N73-27983/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
TRACE ORGANIC IMPURITIES IN GASEOUS HELIUM.
T. A. Schehl. Aug 73, 19p NASA-TN-D-6520

Descriptors: *Helium, *Mass spectra, *Trace contaminants, Gas chromatography, Organic compounds, Qualitative analysis.

For abstract, see STAR 1119

N73-28686/6GA PC$4.25/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
IONIZATION IN THE TRACK OF A HIGH ENERGY ELECTRON IN LIQUID CYCLOHEXANE. PULSE RADIOLYSIS OF SOLUTIONS OF BIPHENYL IN CYCLOHEXANE.
A. Hummel, and L. H. Luthjens. 1972, 42p IRI-133-72-07
Subm-Submitted for Publication.

Descriptors: *Charged particles, *Ionization, *Life (Durability), *Organic liquids, Diffusion theory, Distribution (Property), Electrons, Ionic mobility, Particle trajectories, Radiolysis.

For abstract, see STAR 1119

N73-28934/0GA PC$4.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
COLLISION CROSS SECTIONS BETWEEN OXYGEN MOLECULES AND LOW ENERGY ELECTRONS.
K. Takayanagi, and T. Takahashi. Jul 73, 43p NASA-TT-F-15011
Contract NASW-2481
Tran-Transl. Into English from Daigaku Uchi Koku Kenkyusho Hokoku (Tokyo), V. 3, No. 3, Jul. 1967 p 217-243.

Descriptors: *Electron scattering, *Ionization cross sections, *Molecular collisions, *Oxygen, Electron oscillations, Electron transitions, Molecular excitation, Tables (Data).

For abstract, see STAR 1119

ORNL-TM-4027/GA PC$5.25/MF$1.45
Oak Ridge National Lab., Tenn.
GRAVITY ZERO (G0) ANALYTICAL CLINICAL LABORATORY SYSTEM PROGRESS REPORT FOR THE PERIOD AUGUST 1 TO OCTOBER 31, 1972.
C. A. Burtis, J. C. Mailen, W. F. Johnson, C. D. Scott, and T. O. Tiffany. Feb 73, 63p
Contract NASA-T-118A

Descriptors: Absorption spectroscopy, Bilirubin, Calcium, Magnesium, Photometers, Spectrophotometers, Spectrophotometry, Triglycerides.

For abstract, see NSA 28 03, number 07754.

ORNL-TM-4096/GA PC$6.50/MF$1.45
Oak Ridge National Lab., Tenn.
PROPERTIES OF SOLUTION. WATER RESEARCH PROGRAM BIENNIAL PROGRESS REPORT, MARCH 15, 1966--MARCH 15, 1968.
R. J. Raridon, and G. E. Moore. May 73, 89p
Contract W-7405-eng-26

Descriptors: (*Electrolytes, *Thermodynamic properties), Desalination, Research programs, Self-diffusion, Solutions, Water.

For abstract, see NSA 28 03, number 07755.

ORO-3027-22/GA PC$3.00/MF$1.45
Georgia Inst. Of Tech., Atlanta. School of Electrical Engineering.
EXCITATION AND IONIZATION OF IONS BY ELECTRON IMPACT. TECHNICAL PROGRESS REPORT, SEPTEMBER 1, 1972--MAY 31, 1973.
R. K. Feeney, T. F. Devine, J. W. Hooper, D. McPherson, and W. E. Sayle. 31 May 73, 17p
Contract AT(40-1)-3027

Descriptors: (*Electron collisions, *Excitation), (*Ions, Electron collisions), (*Electron beams, Excitation), Colliding beams, Ionization, Research programs.

For abstract, see NSA 28 03, number 06699.

PATENT-3 419 384/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PREPARATION OF ALKALI METAL DISPERSIONS.
Patent.
A. Rembaum, and R. F. Landel. Patented 31 Dec 68, 4p NASA-CASE-XNP-08876,
Misc-Filed 14 Feb. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Alkali metals, *Dispersions, Patents, Purification, Solubility, Temperature gradients.

A method is described for producing alkali metal dispersions of high purity. The dispersions are prepared by varying the equilibrium solubility of the alkali metal in a suitable organic solvent in the presence of aromatic hydrocarbons. The equilibrium variation is produced by temperature change. The size of the particles is controlled by controlling the rate of temperature change.

PATENT-3 745 089/GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROTEIN STERILIZATION METHOD OF FIREFLY LUCIFERASE USING REDUCED PRESSURE AND MOLECULAR SIEVES.
Patent.
E. W. Chappelle, and E. Rich, Jr.. Patented 10 Jul 73, 2p NASA-CASE-GSC-10225-1,
Misc-Filed 5 Mar. 1968.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Absorbents, *Enzymes, *Proteins, *Sterilization, Patents, Pressure reduction.

The sterilization of the protein fruitfly luciferase under conditions that prevent denaturation is examined. Denaturation is prevented by heating the protein in contact with molecular seives and under a reduced pressure of the order of 0.00005 millimeters of mercury.

PB-223 781/6GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
THE K2HFF6-K2ZRF6-1.25 PERCENT HF SYSTEM AT 40C WITH OTHER SOLUBILITY CURVES FROM 25 TO 70C.
Rept. of Investigations,
Stanley C.Rhoads. Aug 73, 25p BuMines-RI-7785
Prepared by Bureau of Mines, Albany, Oreg. Albany Metallurgy Research Center.

Descriptors: (*Hafnium halides, Solubility), (*Zirconium halides, Solubility), Hydrates, Fluorides, Recrystallization, Solidus, Ternary systems, Hydrogen fluoride, Solid solutions, Phase diagrams.
Identifiers: Zirconate/hexafluoro, Hafniate/hexafluoro.

The complete ternary system K2HfF6-K2ZrF6-1.25 weight percent HF was investigated at 40C. Additional solubility curves were established from 25 - 70C. At 40C the solid phase of the system contains solid solution hydrates with K2HfF6.H2O and K2ZrF6.3H2O segments existing at the respective extremes of this system. This system is not ideal for simple separation of high purity K2HfF6 from K2HfF6-K2ZrF6 mixtures by recrystallization. However it could be useful for producing hafnium enriched feed solutions from zircon concentrates for liquid-liquid extraction of hafnium from zirconium. (Modified author abstract)

RD/B/N-2091/GA PC$9.75/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
PROGRAM FOR THE ON-LINE PROCESSING OF DATA FROM AUTOMATIC GAS ANALYSIS EQUIPMENT USING A PDP 8/I COMPUTER.
R. D. Russell. Aug 72, 152p
U.S. Sales Only.

Descriptors: (*Irradiation devices, *Data processing), (*Gas analysis, Data processing), Automation, Data acquisition, Gamma radiation, Gas chromatography, Pdp computers, Time measurement.

For abstract, see NSA 28 02, number 02500.

RFP-1985/GA PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
HEATS OF SOLUTION OF BERYLLIUM IN CHEMICAL MILLING SOLUTIONS.
J. D. Navratil, and F. L. Oetting. 24 Jan 73, 6p
Contract AT(29-1)-1106

Descriptors: (*Beryllium, *Solution heat), Chemical machining, Milling.

For abstract, see NSA 28 02, number 03156.

RLO-1388-200/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
ELECTRON LOSS IN HIGH-ENERGY OXYGEN--ION COLLISIONS.
D. Burch, H. Wieman, and W. B. Ingalls. 1973, 11p

Descriptors: (*Argon, *Ion collisions), (*Oxygen ions, *Collisions), Differential cross sections, Electron loss, Electrons, Mev range 10-100, Spectra.

For abstract, see NSA 28 02, number 03752.

RLO-2221-T-4-11/GA PC$4.00/MF$1.45
Washington State Univ., Pullman. Dept. Of Chemistry.
FINAL REPORT ON CHEMISTRY, MAY 16, 1967--SEPTEMBER 1, 1972.
J. P. Hunt. 1972, 5p
Contract AT(45-1)-2221

Descriptors: (*Metals, *Chemical reactions), (*Oxygen 17, *Nuclear magnetic resonance), Aqueous solutions, Complexes, Solutions.

For abstract, see NSA 28 03, number 07768.

RLO-2227-T-1-8/GA PC$3.25/MF$1.45
Oregon State Univ., Corvallis. Dept. Of Chemistry.
REACTIONS OF MATRIX ISOLATED NIF SUB 2 AND NICL SUB 2 WITH CO, N SUB 2 , NO, AND O SUB 2 IN ARGON MATRICES.
D. A. Van Leirsburg, and C. W. DeKock. 1972, 23p

Descriptors: (*Nickel fluorides, *Chemical reaction kinetics), (*Nickel chlorides, Chemical reaction kinetics), Argon, Carbon monoxide, Crystal doping, Infrared spectra, Matrices, Nickel complexes, Nitrogen, Nitrogen oxides, Oxygen.

For abstract, see NSA 28 02, number 05061.

SGAE-PH-136/73/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Physik-Institut.
GAS SCATTERING AS A LIMIT TO PARTIAL PRESSURE SENSITIVITY.
F. G. Ruedenauer. Jan 73, 16p CONF-711045-2, SGAE-2080
U.S. Sales Only.

Descriptors: (*Mass spectrometers, *Sensitivity), Elastic scattering, Gases, Ion beams, Low pressure, Molecules, Pressure gages.

For abstract, see NSA 28 02, number 05069.

SGAE-PH-138/73/GA PC$4.50/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf.
ASPECTS OF QUALITATIVE AND QUANTITATIVE ANALYSIS SECONDARY MASS SPECTROMETRY.
F. G. Ruedenauer, W. Steiger, and R. Portenschlag. Jan 73, 45p SGAE-2082, CONF-721087-1
In German. U.S. Sales Only.

Descriptors: (*Metals, *Chemical analysis), Emission spectroscopy, Ion collisions, Ion emission, Qualitative chemical analysis, Quantitative chemical analysis, Solids.

For abstract, see NSA 28 02, number 02160.

SLA-73-5233/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PULSED LASER INDUCED VAPORIZATION OF GRAPHITE AND CARBIDES.
R. T. Meyer. 1973, 2p CONF-730601-1

Descriptors: (*Titanium carbides, *Chemical composition), (*Vanadium carbides, Chemical composition), (*Chromium carbides, Chemical composition), (*Zirconium carbides, Chemical composition), Graphite, Hafnium carbides, Lasers, Molybdenum carbides, Tantalum carbides, Tungsten carbides, Uranium carbides, Vaporization heat, Vapors.

For abstract, see NSA 28 02, number 03030.

TID-26327/GA PC$8.25/MF$1.45
Louisiana State Univ., Baton Rouge.
ELECTRONIC SPECTROSCOPY OF HIGHLY-POLAR AROMATICS.
O. S. Khalil. Dec 72, 125p

Descriptors: (*Aniline, *Spectra), (*Nitro compounds, Spectra), (*Cyanides, Spectra), (*Organic nitrogen compounds, Spectra), Absorption spectra, Dipoles, Electric dipole moments, Electronic structure, Energy-level transitions, Excited states, Interactions, Luminescence, Solvents.

For abstract, see NSA 28 03, number 07798.

TID-26328/GA PC$22.75/MF$1.45
Louisiana State Univ., Baton Rouge.
EXCITED STATE PROPERTIES OF AMIDE-CONTAINING MOLECULES.
D. B. Larson. Aug 72, 413p

Descriptors: (*Amides, *Excited states), Chemical properties, Excitation, Heterocyclic compounds, Molecular structure, Organic nitrogen compounds, Physical properties.

For abstract, see NSA 28 03, number 07799.

TID-4068/GA PC$7.60/MF$1.45
Division of Physical Research (Aec), Washington, D.C.
RESEARCH AND DEVELOPMENT IN PROGRESS. SUMMARIES OF THE USAEC BASIC RESEARCH PROGRAM IN CHEMISTRY.
Jan 73, 173p

Descriptors: (*Chemistry, *Research programs), Us aec.

For abstract, see NSA 28 03, number 05086.

TT-72-51121/GA PC$2.75/MF$1.45
Agricultural Research Service, Washington, D.C.
THERMOGRAPHIC STUDY OF CRYSTALLIZATION OF SUGAR AT DIFFERENT SOLUTION TEMPERATURES (TERMOGRAFICHESKOE ISSLEDOVANIE KRISTALLIZATSII SAKHARA PRI RAZLICHNOI TEMPERATURE RASTVORA),
A. V. Zubchenko, and S. E. Kharin. 1973, 11p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n1 p123-126 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Sugars, *Crystallization), Kinetics, Phase transformations, Graphic methods, Adiabatic conditions, Temperature, Translations, Crystal growth, USSR, Thermogravimetry.
Identifiers: Thermograms.

The translation describes a thermographic study of crystallization of sugar. Values for the order of reaction and velocity constant of crystallization are derived from adiabatic difference in temperatures from non-isothermal crystallization kinetics. Relations between growth rates and temperature are derived.

UCRL-51367/GA PC$5.45/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SHOCK WAVE HUGONIOT AND ELECTRICAL CONDUCTIVITY OF LIQUID AMMONIA IN THE PRESSURE RANGE 45 KB TO 282 KB.
M. I. Kovel. 22 Mar 73, 94p
Contract W-7405-eng-48

Descriptors: (*Ammonia, *Electric conductivity), Equations of state, High temperature, Shock waves, Very high pressure, Very high temperature.

For abstract, see NSA 28 03, number 07807.

UR-3490-98/GA PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa). Dept. Of Biophysics.
COMPUTER PROGRAM FOR QUANTITATIVE MICROANALYSIS OF THIN BIOLOGICAL MATERIAL.
R. R. Warner, and J. R. Coleman. 1972, 5p CONF-720714-4
Contract AT(11-1)-3490

Descriptors: (*Microanalysis, *Automation), (*Biological materials, *X-ray fluorescence analysis), B codes, Computer codes, Quantitative chemical analysis.

For abstract, see NSA 28 03, number 07821.

Y-DJ-8055(Rev.1)/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
APPRECIATION OF BAYESIAN TOLERANCE LIMITS FOR CHEMICAL IMPURITIES.
J. L. Telford. 1970, 7p CONF-730506-1
Contract W-7405-eng-26

Descriptors: (*Chemical analysis, *Impurities), Statistics.

For abstract, see NSA 28 03, number 07829.

7E. Radio and Radiation Chemistry

AD-767 137/3GA Reprint
Scripps Institution of Oceanography La Jolla Calif
SIMULTANEOUS DETERMINATION OF MANGANESE, COPPER, ARSENIC, CADMIUM, ANTIMONY AND MERCURY IN GLACIAL ICE BY RADIOACTIVATION,
Interim rept.,
H. V. Weiss, and K. K. Bertine. 20 Nov 72, 9p
Contract AT(11-1)-34, Grant NSF-GA-27306
Availability: Pub. in Analytica Chimica Acta, v65 p253-259 1973.

Descriptors: (*Radioactivation analysis, *Ice), (*Manganese, Radioactivation analysis), (*Copper, Radioactivation analysis), (*Arsenic, Radioactivation analysis), (*Cadmium, Radioactivation analysis), (*Antimony, Radioactivation analysis), (*Mercury, Radioactivation analysis), Beta particles, Gamma rays, Chemical analysis, Microanalysis, Sensitivity, Neutron activation, Glaciers.
Identifiers: Neutron activation analysis.

A method was developed to measure simultaneously the concentration of the elements manganese, copper, arsenic, cadmium, antimony, and mercury in glacial ice. Samples and comparators were irradiated in a thermal flux. The six elements were separated from the irradiated samples sequentially; mercury, arsenic, and cadmium received additional radiochemical purification. The gamma-rays of the 56Mn, 64Cu, 76As, 122Sb, and 197Hg and the beta-rays of the 115Cd-115In were measured. All the elements were detectable at the subnanogram level. Comparison of the detection limits with the concentration of elements in the samples indicated that, even with the moderate neutron flux available and for ice from a relatively uncontaminated environment, the methods used were sensitive enough for adequate characterization. (Modified author abstract)

AD-767 138/1GA Reprint
North Carolina Univ Chapel Hill Dept of Chemistry
PHOTOCHEMISTRY OF CYCLOALKENES. VIII. 2-PHENYL-2-NORBORNENE AND 2-PHENYL-2-BORNENE,
Paul J. Kropp. 18 Aug 72, 12p AROD-10268:1-C
Grant DA-ARO-D-31-124-72-G50
Availability: Pub. in Jnl. of the American Chemical Society, v95 n14 p4611-4619, 11 Jul 73.

Descriptors: (*Cycloalkenes, *Photochemistry), (*Terpenes, Photochemistry), Fluorescence, Photolysis, Nuclear magnetic resonance, Spectra(Visible + ultraviolet), Chemical reactions, Molecular energy levels, Quenching(Inhibition).
Identifiers: Chemical reaction mechanisms, *Norbornenes, Norbornanes, Bornanes.

The photochemical behavior of 2-phenyl-2-norbornene (I) was found to be substantially different from that of the unsubstituted analog 2-norbornene. Direct irradiation of I in methanol solution afforded a mixture of the ether and the endo and exo isomers of 2-phenylnorbornane. Labeling studies with methanol-O-d showed that each of these products was formed in an ionic process involving exo-side protonation. Similar ionic photochemical behavior was exhibited by the homolog 2-phenyl-2-bornene, which on irradiation in methanol solution afforded a mixture of 2-endo- and 2-exo-phenylbornane, 1-phenylcamphene, and ethers. Sensitization of I with triplet acetophenone or fluorene afforded no significant photoproducts, and the fluorescence of I was found to be quenched by methanol. This photochemical behavior is therefore interpreted in terms of a reactive singlet excited state displaying charge-transfer character and is compared with the photochemical behavior reported for other styryl systems. (Modified author abstract)

AD-767 230/6GA PC$4.25/MF$1.45
Boeing Aerospace Co Seattle Wash Research and Engineering Div
PERFORMANCE EVALUATION AND REACTION KINETICS OF A PULSED HF LASER.
Technical rept. 29 Oct 71-28 Oct 72,
J. D. McClure, D. B. Nichols, and K. H. Wrolstad. Aug 73, 118p AFWL-TR-73-7
Contract F29601-72-C-0008, ARPA Order-1256

Descriptors: (*Gas lasers, Reaction kinetics), Photolysis, Fluorides, Hydrogen compounds, Performance(Engineering), Molecular energy levels.
Identifiers: Performance evaluation, *Hydrogen fluoride lasers, Collisional energy transfer, Chemical reaction mechanisms, Chain reactions, Emission spectra, Pulsed lasers, *Chemical lasers.

Variation of performance of a laser-initiated HF laser with variation in reagent concentrations, reagent-diluent concentration ratio, and initial dissociation level is described. The HF laser intensity transients exhibit characteristic temporal structure representative of free-running chain reactions and collisional transfer processes in reacting H2 - F2 mixtures. Explicit exposure of underlying mechanisms is achieved by fast dissociation of F2 via second harmonic radiation derived from a Q-switched ruby laser pulse, and by simultaneous time-resolved spectral measurements of laser emission on a number of vibration-rotation transitions. Continued laser emission over many chain-reaction steps, even for relatively low dissociation levels, supports the position that pulsed chemical lasers are attractive candidates for high power applications. (Modified author abstract)

AD-767 263/7GA PC$4.25/MF$1.45
Maryland Univ College Park Dept of Chemical Engineering
EFFECT OF LET ON THE CERIC/CUPRIC G-VALUE.
Contract rept. Jun 69-Dec 71,
Frank J. Munno, and Theodore G. Smith. Jun 73, 43p EA-CR-1210-3
Contract DAAA15-69-C-0755

Descriptors: (*Dosimeters, *Cerium compounds), Gamma rays, Sulfates, Copper compounds, Sulfuric acid, Solutions, Radiation measurement systems, Alpha bombardment, Impurities, Proton bombardment.
Identifiers: *Chemical dosimeters, Performance evaluation.

The G(Ce(3+)) value of a 1 millimolar solution of ceric sulfate in a 100 millimolar solution of cupric sulfate in 0.4 molar H2SO4 was investigated. This quantity was measured for radiation of varying quality. The radiation sources included protons, alpha particles and cobalt-60 gamma rays. The ceric/cupric solution was found to be sensitive to impurities, but in general could be managed. Results indicate that all glass systems are necessary for best results. (Modified author abstract)

AD-767 472/4GA Reprint
University Coll Dublin (Ireland) Dept of Chemistry
REACTIONS INVOLVING ELECTRON TRANSFER AT SEMICONDUCTOR SURFACES. IV. ZINC OXIDE-PROMOTED PHOTOREDUCTIONS IN AQUEOUS SOLUTIONS AT NEUTRAL PH,
Joseph Cunningham, and Hansa Zainal. 4 Nov 71, 15p AFOSR-TR-73-1868
Grant AF-AFOSR-2148-71
See also report dated 22 Jul 70, AD-725 693.
Availability: Pub. in The Jnl. of Physical Chemistry, v76 n17 p2362-2374 1972.

Descriptors: (*Photochemistry, Reduction(Chemistry)), (*Zinc compounds, Catalysts), (*Reduction(Chemistry), *Catalysis), (*Semiconductors, *Catalysts), Paramagnetic resonance, Great Britain, Nitrates, Oxides, Permanganates, Amines, N-heterocyclic compounds, Reaction kinetics, Ultraviolet radiation, Interfaces, Solutions, Adsorption.
Identifiers: Quantum efficiency, Anilines, Zinc oxides, Indigo dyes, Aniline/nitroso-N-N-dimethyl, Chemical reaction mechanisms.

Quantum efficiencies have been determined for reduction reactions produced by uv illumination of different zinc oxides suspended in aqueous solutions containing NaNO3,KMnO4, indigo carmine or p-nitroso-dimethylaniline (PNDA). Consideration is given to factors at the zinc oxide-aqueous solution interface which allowed these quantum efficiencies to exceed by two to three orders of magnitude those previously reported for zinc oxide promoted photoreactions at zinc oxide-gas interfaces. An electron paramagnetic resonance (epr) signal was observed from zinc oxide suspensions in various aqueous solutions, but only when these were illuminated by uv light. This epr signal was used to measure the tendency of various solutes to increase or decrease the number of electrons available at the surface of the illuminated zinc oxide particles while suspended in aqueous solutions. Techniques of competition kinetics were also utilized to check ability of an additive to interact with photoproduced intermediates at these illuminated interfaces. Probable reducing and oxidizing processes are discussed for the H2O-ZnO interface at neutral pH. (Modified author abstract)

AD-767 488/0GA Reprint
Wisconsin Univ Madison Dept of Chemistry
PHOTOLYSIS OF 1,2,4,5-TETRAKIS(TRIMETHYLSILYL)BENZENE,
Robert West, Masaoki Furue, and V. N. Mallikarjuna Rao. 6 Feb 73, 6p AFOSR-TR-73-1732
Grant AF-AFOSR-1904-70
Revision of report dated 2 Jan 73.
Availability: Pub. in Tetrahedron Letters, n12 p911-914 1973.

Descriptors: (*Benzenes, *Photolysis), (*Silanes, Photolysis), Cyclohexenes, Cyclopentenes, Spectra(Infrared), Spectra(Visible + ultraviolet), Nuclear magnetic resonance.
Identifiers: Silicon organic compounds, Fulvenes.

Photolysis of 1,2,4,5-tetrakis(trimethylsilyl)benzene gives as major products two isomeric tetrakis(trimethylsilyl)benzvalenes and as minor products two isomeric

tetrakis(trimethylsilyl)fulvenes along with 1,2,3,5-tetrakis(trimethylsilyl)benzene. Nmr, ir and uv structural evidence for these new compounds is presented. (Author)

AEC-tr-7424/GA PC$10.00/MF$1.45
Mainz Univ. (West Germany).
REACTIONS OF FISSION RECOIL ATOMS, PARTICULARLY OF IODINE, WITH METHANE AND OTHER GASES.
J. O. Denschlag. 1965, 157p
Translation of a German thesis.

Descriptors: (*Methane, *Hot atom chemistry), (*Iodine 131, Hot atom chemistry), (*Iodine 133, Hot atom chemistry), (*Iodine 134, Hot atom chemistry), Chemical reaction yield, Fission products, Iodinated aliphatic hydrocarbons, Iodine 135, Methyl iodide, Recoils.

For abstract, see NSA 28 02, number 02382.

ARH-2624/GA PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash.
DETERMINATION OF SULFUR BY SPECIFIC ION ELECTRODE AFTER SEPARATION FROM PLUTONIUM AND URANIUM OXIDES BY DISTILLATION.
W. I. Winters, and S. G. Metcalf. Mar 73, 51p
CONF-730403-3
Contract AT(45-1)-2130

Descriptors: (*Uranium oxides, *Chemical analysis), (*Plutonium oxides, Chemical analysis), (*Plutonium nitrates, Chemical analysis), (*Uranium nitrates, Chemical analysis), Distillation, Errors, Hydrochloric acid, Hydroxylamine, Ion selective electrode analysis, Quantitative chemical analysis, Sensitivity, Sulfides, Sulfur.

For abstract, see NSA 28 02, number 02156.

BNL-17682/GA PC$7.75/MF$1.45
Brookhaven National Lab., Upton, N. Y.
SYNTHESIS OF RADIOPHARMACEUTICALS AND LABELED COMPOUNDS UTILIZING SHORT-LIVED ISOTOPES.
A. P. Wolf, D. R. Christman, J. S. Fowler, and R. M. Lambrecht. 1972, 115p CONF-730309-7

Descriptors: (*Organic compounds, *Labelling), (*Radioisotopes, *Radiochemistry), (*Drugs, Labelling), Bibliographies, Carbon 11, Chemical preparation, Fluorine 18, Iodine 123, Isotope production, Labelled compounds, Lifetime, Nitrogen 13, Nuclear medicine, Oxygen 15, Reviews, Uses.

For abstract, see NSA 28 02, number 02391.

BNL-17765/GA PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N. Y.
REACTION OF HALOCARBONS WITH PHOTOCHEMICALLY GENERATED HYDROGEN ATOMS.
D. R. MacKenzie, and L. Graham. Dec 72, 24p

Descriptors: (*Hydriodic acid, *Photolysis), (*Hydrogen, *Chemical reactions), (*Tetrachloromethane, Chemical reactions), (*Freons, Chemical reactions), Atoms, Chemical reaction kinetics, Chemical reaction yield, Chloroform, Helium, Hydrochloric acid, Organic chlorine compounds, Organic fluorine compounds, Chlorinated aliphatic hydrocarbons, Fluorinated aliphatic hydrocarbons, Hydrofluoric acid.

For abstract, see NSA 28 03, number 07663.

CEA-R-4402/GA PC$8.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
CONTRIBUTION TO THE THERMODYNAMIC STUDY OF PLUTONIUM OXIDES AND MIXED URANIUM--PLUTONIUM OXIDES.
P. Chereau. Feb 73, 120p
In French. U.S. Sales Only.

Descriptors: (*Plutonium oxides, *Thermodynamic properties), (*Uranium dioxide, Thermodynamic properties), Calorimeters, Enthalpy, Mixing heat, Oxygen, Very high temperature, Mixtures, Phase diagrams.

For abstract, see NSA 28 02, number 03018.

CEA-R-4417/GA PC$3.25/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
DETERMINATION OF THE PHYSICO-CHEMICAL STATE OF RADIONUCLIDES AND LABELLED COMPOUNDS IN SOLUTION IN BIOLOGICAL FLUIDS: FE, CE, NP, AND CALCITONINE BY CURRENT FLOW ELECTROPHORESIS.
R. Masse, V. Jovanovic, P. Fragu, I. L'Hullier, and J. Lafuma. Feb 73, 22p
In French. U.S. Sales Only.

Descriptors: (*Labelled compounds, *Chemical properties), (*Radioisotopes, *Chemical state), (*Iron complexes, Chemical properties), (*Cerium complexes, Chemical properties), Biological materials, Cerium 144, Electrophoresis, Iodine 125, Iron 55, Neptunium, Neptunium complexes, Solutions.

For abstract, see NSA 28 02, number 02392.

CEA-R-4451/GA PC$5.50/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
APPLICATION OF PHYSICOCHEMICAL METHODS OF ANALYSIS TO TRILAURYLAMINE RADIATION STABILITY STUDY.
J. C. Saey, M. Germain, and A. Bathellier. May 73, 68p
In French. U.S. Sales Only.

Descriptors: (*Amines, *Radiolysis), Gamma radiation, Photon beams.

For abstract, see NSA 28 03, number 05287.

CNEA-325/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
INFLUENCE OF THE PROPERTIES OF EXP 131 I PREPARATIONS ON THE LABELING OF POLYPEPTIDES BY MEANS OF THE CHLORAMINE-T METHOD.
H. Kurcbart, S. Quiroga, R. A. Caro, and R. Radicella. 1972, 15p
In Spanish. U.S. Sales Only.

Descriptors: (*Iodine 131, *Radiochemistry), (*Polypeptides, *Labelling), Chloramines, Impurities, Labelled compounds, Sodium iodides.

For abstract, see NSA 28 02, number 02393.

COM-73-50786/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
USE OF RADIOCHROMIC DYE SYSTEMS FOR DOSIMETRY.
Final rept.,
P. E. Hjortenberg, and W. L. McLaughlin. 1973, 19p
Also pub. in Proceedings of Regional Conference on Radiation Protection, Jerusalem, Israel, Mar 73.
Pub. in Paper in Radiation Protection, v1 p122-140 1973.

Descriptors: (*Chemical dosimeters, Dyes), Radiation measuring instruments, Performance evaluation, Electron accelerators, Gamma irradiation, X rays.

Identifiers: Shelf life, Fricke dosimeter system, Thermoluminescent dosimetry.

Radiochromic dye systems have been developed. Measurable absorbed doses range from 100 to 10 to the 8th rads, depending on the particular system. Some characteristic properties are as follows: long shelf life, dose rate independence, low atomic number constituents (C, H, N, O), small temperature dependence, sensitivity to ultraviolet light, linear dose response, rather insensitive to organic impurities. In this paper a liquid system with a useful dose range of 100-100,000 rads is described. Results demonstrate its capabilities for calibration of radiation fields including isotope irradiators and electron accelerators. Intercomparisons were made with Fricke- and thermoluminescence dosimetry.

CONF-721010-68/GA PC$3.00/MF$1.45
Geneva Univ. (Switzerland).
METHOD OF MEASURING THE HALF-LIFE OF A RADIOACTIVE SUBSTANCE: APPLICATIONS.
R. Beeler, L. Balsenc, and J. Laplace. 1972, 9p
In French. U.S. Sales Only.

Descriptors: (*Activation analysis, *Counting techniques), (*Hafnium 179, *Half-life), (*Silver 108, Half-life), (*Selenium 77, Half-life), Aluminium 28, Measuring methods, Scandium 46, Sodium 24, Vanadium 52.

For abstract, see NSA 28 02, number 02099.

CONF-721010-71/GA PC$3.00/MF$1.45
Pavia Univ. (Italy).
RADIOCHEMICAL SEPARATIONS BY ADSORPTION ON SOME OXIDES OF IVB AND VB GROUPS.
M. T. Ganzerli-Valentini, S. Meloni, V. Maxia, and U. Pisani. 1972, 20p
U.S. Sales Only.

Descriptors: (*Titanium oxides, *Sorptive properties), (*Niobium oxides, Sorptive properties), (*Tantalum oxides, Sorptive properties), (*Technetium 99, *Radioisotope generators), Adsorption, Adsorption, Multi-element separation, Nitric acid, Quantitative chemical analysis, Radiochemistry.

For abstract, see NSA 28 02, number 02232.

CONF-721010-83/GA PC$3.00/MF$1.45
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (East Germany).
BETA GAMMA COINCIDENCE SPECTROSCOPY OF RADIOCHEMICAL SEPARATED NUCLIDES IN HIGH SENSITIVE NEUTRON ACTIVATION ANALYSIS.
S. Niese. 1972, 8p
U.S. Sales Only.

Descriptors: (*Iron, *Activation analysis), (*Copper, Activation analysis), (*Silver, Activation analysis), (*Gold, Activation analysis), Accuracy, Beta detection, Coincidence methods, Gamma spectroscopy, Impurities, Manganese, Multi-element separation, Neutron beams, Quantitative chemical analysis, Semiconductor materials, Sensitivity, Silicon, Solid scintillation detectors, Thermal neutrons.

For abstract, see NSA 28 02, number 02112.

COO-1617-36/GA PC$3.50/MF$1.45
Nebraska Univ., Lincoln. Dept. Of Chemistry.
HALOGEN ATOM REACTIONS ACTIVATED BY RADIATIVE NEUTRON CAPTURE AND ISOMERIC TRANSITION. PROGRESS REPORT 7.
1972, 29p
Contract AT(11-1)-1617

Descriptors: (*Bromine isotopes, *Radiochemistry), (*Chlorine isotopes, Radiochemistry), (*Iodine isotopes, Radiochemistry), Capture, Chemical reactions, Gases, Halogenated aliphatic hydrocarbons, Hydrocarbons, Isomeric transitions, Liquids, Neutron beams, Nuclear reactions, Recoils, Research programs, Solids.

For abstract, see NSA 28 03, number 05354.

COO-3007-25/GA PC$3.50/MF$1.45
Delaware Univ., Newark. Dept. Of Chemistry.
ROLE OF STRUCTURE AND ENERGY (OR IONIZATION) TRANSFER IN RADIATION CHEMISTRY AND BIOLOGY. FINAL REPORT.
C. N. Trumbore. 1973, 27p
Contract AT(11-1)-3383

Descriptors: (*Radiation chemistry, *Research programs), (*Aqueous solutions, *Radiolysis), (*Cysteine, Radiolysis), (*Algae, *Radiosensitivity).

For abstract, see NSA 28 02, number 02328.

KFK-1788/GA PC$7.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
PROJECT ACTINIDES: SECOND SEMIANNUAL REPORT, 1972.
Mar 73, 103p
In German. U.S. Sales Only.

Descriptors: (*Americium, *Chemical properties), (*Curium, Chemical properties), (*Americium alloys, *Physical radiation effects), (*Aluminium alloys, Physical radiation effects), Research programs, Amines, Neptunium, Neptunium 237, Plutonium, Reprocessing, Solvent extraction, Targets, Uranium, Fuels, Liquid wastes, Separation processes, Cermets, Activation analysis, Neutron sources, Production, Radiation sources, Boreholes, Nuclear reaction analysis, Tungstates, Well logging.

For abstract, see NSA 28 03, number 05433.

N73-27937/4GA PC$3.25/MF$1.45
Florida State Univ., Tallahassee. Inst. of Molecular Biophysics.
RESEARCH IN PHOTOBIOLOGY AND PHOTOCHEMISTRY.
Final Report, 1964 - 1973.
H. Gaffron. 18 Jul 73, 22p NASA-CR-133459
Contract NGR-10-004-018

Descriptors: *Bioluminescence, *Nasa programs, *Photochemical reactions, Indexes (Documentation), Research.

For abstract, see STAR 1119

ORO-4059-3/GA PC$3.00/MF$1.45
Baylor Univ., Waco, Tex.
RADIATION CHEMISTRY OF HIGH POLYMERS. PROGRESS REPORT NO. 3, 15 APRIL 1972--1 MAY 1973.
M. Dole, and R. A. Welch. 15 May 73, 9p
Contract AT(40-1)-4059

Descriptors: (*Polyethylenes, *Radiolysis), (*Hydrogen, *Solubility), Alkyl radicals, Allyl radicals, Electron spin resonance, Gamma radiation, Photon beams, Radiation chemistry.

For abstract, see NSA 28 03, number 05288.

PB-223 960/6GA PC$4.25/MF$1.45
Rockwell International Corp., Thousand Oaks, Calif. Science Center.
MECHANISMS OF FORMATION AND COMPOSITION OF PHOTOCHEMICAL AEROSOLS.
Final rept.,
M. Lipeles, C. S. Burton, H. H. Wang, E. P. Parry, and G. M. Hidy. Sep 73, 104p SC537.10FR CRC-APRAC-CAPA-8-71-1

Descriptors: (*Aerosols, *Photochemical reactions), (*Smog, Photochemical reactions), Precipitation(Chemistry), Ozone, Nitrogen dioxide, Sulfur dioxide, Water, Air, Hexenes, Chemical composition, Chemical reactors, Air pollution, Alkene hydrocarbons, Chemical analysis, Gas flow, Ultraviolet radiation, Gas chromatography.
Identifiers: Chemical reaction mechanisms.

The report details a feasibility study of a flow reactor concept for the study of the mechanism of formation and composition of photochemical aerosols. The technique involves a fast flow reactor which may be operated in a 'wall free' mode. Aerosols have been produced in this reactor from a light irradiated gas mixture including NO2, 1-hexene, SO2, H2O, and air. The chemical composition of these aerosols has been analyzed. Aerosols were also sought in a NO2, 1-hexene, and dry air mixture but have not yet been obtained. The report includes preliminary design studies and experimental study and, a discussion of related aspects of a study of aerosol formation in ozone-olefin reactions. (Modified author abstract)

RLO-2225-T-15-15/GA PC$3.00/MF$1.45
Washington Univ., Seattle.
PHOTOBIOLOGY AND PHOTOCHEMISTRY OF RIBONUCLEIC ACIDS. PROGRESS REPORT FOR THE PERIOD MARCH 1972--MARCH 1973.
M. P. Gordon. 8p
Contract AT(45-1)-2225

Descriptors: (*Rna, *Photochemistry), (*Viruses, *Biological radiation effects), (*Plants, Biological radiation effects), Biological repair, Carbon 14, Escherichia coli, In vitro, Inactivation, Nicotiana, Photoreactivation, Pyrimidines, Seedlings, Sun, Tobacco mosaic virus, Tryptophan, Ultraviolet radiation.

For abstract, see NSA 28 02, number 02821.

SAN-849-2/GA PC$3.00/MF$1.45
Medi-Physics, Inc., Emeryville, Calif. (Usa).
SYNTHESIS AND EVALUATION OF EXP 11 C-LABELED ORGANIC COMPOUNDS FOR USE IN NUCLEAR MEDICINE. SECOND ANNUAL REPORT.
T. H. Lin, and H. S. Winchell. Mar 73, 12p
Contract AT(04-3)-849

Descriptors: (*Carbon 11, *Radiochemistry), (*Organic compounds, *Labelling), Chemical preparation, Labelled compounds, Nuclear medicine.

For abstract, see NSA 28 03, number 05366.

SRARI-P-138/GA PC$3.25/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
EXISTENCE OF NEPTUNIUM PROTOXIDE-OXIDE.
L. V. Sudakov, V. M. Solntsev, I. I. Kapshukov, Yu. I. Belyaev, and V. M. Chistyakov. 1972, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Neptunium oxides, *Chemical preparation), Crystal structure, Neptunium hydroxides.

For abstract, see NSA 28 02, number 03031.

SRARI-P-158/GA PC$3.00/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
SOME REGULARITIES IN COMPLEXING TRIVALENT IONS OF AMERICIUM, CURIUM, AND PROMETHIUM WITH PHOSPHORUS- AND CARBOXYL-CARRYING LIGANDS.
A. A. Elesin, and A. A. Zaitsev. 1972, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Americium complexes, *Chemical preparation), (*Curium complexes, Chemical preparation), (*Promethium complexes, Chemical preparation), Carboxylic acid salts, Cations, Organic phosphorus compounds, Valence.

For abstract, see NSA 28 02, number 02395.

TID-26304/GA PC$3.75/MF$1.45
Worcester Polytechnic Inst., Mass.
VACUUM UV PHOTOLYSES OF PROPYLENE OXIDE AND OXETANE.
H. T. Hsi. Oct 72, 33p

Descriptors: (*Organic oxygen compounds, *Photolysis), (*Nitrogen oxides, *Chemical reactions), (*Hydrogen sulfides, Chemical reactions), Chemical reaction kinetics.

For abstract, see NSA 28 03, number 07797.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-767 563/0GA MF$1.45
Wrightsville Marine Bio-Medical Lab Wilmington N C
BAROBIOLOGY AND THE EXPERIMENTAL BIOLOGY OF THE DEEP SEA.
Final rept.,
Ralph W. Brauer. Sep 73, 446p
Contract N00014-71-C-0256
Proceedings of the First Symposium on High Pressure Aquarium Systems as Tools for the Study of the Biology of Deep Ocean Fauna and Associated Biological Problems.
Availability: Paper copy available from: North Carolina Sea Grant Program, School of Public Health, North Carolina Univ., Chapel Hill. 27514. $10.00.

Descriptors: (*Marine biology, *High-pressure research), (*Stress(Physiology), High-pressure research), Aquatic animals, Barometric pressure, Oceans, Scientific research, Experimental design, Ocean bottom.
Identifiers: *Hyperbaric atmospheres, Benthos, Aquariums.

The monograph reviews various factors to be taken into consideration in design and application of high pressure aquarium systems to the study of the biology of deep sea fauna. The topics covered include biological and oceanographic problems requiring high pressure aquaria; observations on deep sea fauna, in situ experiments, methods of retrieving deep ocean fauna, and choice of potential biological materials for study in high pressure aquaria; chemical aspects--sensors, properties of solutions, and of macromolecules; high pressure aquaria--general design characteristics; and, design and performance characteristics of currently existing high pressure aquarium systems. The monograph consists of formal contributions by 50 authors representing research efforts in six nations, supplemented by transcripts of discussions critically reviewing or extending the information provided in the formal communications. (Author)

COM-73-11467/0GA PC$5.50/MF$1.45
University of Southern California, Los Angeles. Allan Hancock Foundation.
MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART II: BIOLOGICAL INVESTIGATIONS,
Dorothy F. Soule, and Mikihiko Oguri. Jun 73, 224p USC-SG-2-73 NOAA-73082105

Contract NOAA-043-158-45
See also Part I, COM-73-11466.

Descriptors: (*Ecology, *San Pedro Bay), (*Marine biology, San Pedro Bay), (*Water pollution, San Pedro Bay), Canneries, Waste disposal, Fishes, Marine fishes, Coasts, Bays, California, Graphs(Charts).
Identifiers: Ecosystems, Sea Grant program, Engraulis mordax, Anchovies.

A compilation of nine biological studies made in San Pedro Bay, California is reported. These deal with the following: The effect of cannery effluent on the ecosystem of Los Angeles Harbor waters; free amino acid variation in the anchovy; roles of microbial activity in the harbor ecosystem; the dilution of cannery wastes discharges; results of fourteen benthic trawls in the outer Los Angeles--Long Beach Harbor; the demersal fish populations of San Pedro Bay; and the numerical analysis of a benthic transect in the vicinity of waste discharges in the outer Los Angeles Harbor. There are annotated bibliographies on cannery effluents and on the northern anchovy Engraulis mordax Girard.

8B. Cartography

AD-767 555/6GA PC$4.25/MF$1.45
CBS Labs Stamford Conn
INVESTIGATION, EXPERIMENTS, AND STUDY OF ELECTRON BEAM RECORDER (EBR) TECHNIQUES FOR MAP PRODUCTION.
Final technical rept.,
P. F. Grosso, A. A. Tarnowski, and M. H. Gold.
Jun 73, 101p ETL-CR-73-15
Contract DAAK02-72-C-0425

Descriptors: (*Mapping, Automation), Design, Recording systems, Electron beams, Electron optics, Data processing systems.
Identifiers: Photoscopic storage, Computer aided mapping, Reproduction(Copying), Digital pictures, Image processing.

The report documents the use of electron beam recording techniques to produce micromap color separation negatives to subsequently be enlarged and printed for publication at standard Army topographic map sizes at scales of 1:100,000 or larger. The report describes the graphics input generator supplied by USAETL to CBS Laboratories (CLD), the interface and random access beam positioning electronics developed by CLD, the CLD electron beam recorder (EBR) used in the investigation, and generation of micromap data on film chips with the EBR using software and magnetic tape inputs prepared by Fort Belvoir personnel. The results of this investigation indicate that electron beam recording can be employed in a vector plotting mode for the generation of micromap color separations and can achieve the required high resolution performance levels. (Author)

N73-27332/8GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NOTES FOR THE IMPROVEMENT OF A REMOTE SENSING MULTISPECTRAL DATA NON-SUPERVISED CLASSIFICATION AND MAPPING TECHNIQUE.
C. C. Dalton. 27 Jul 73, 33p NASA-TM-X-64762

Descriptors: *Algorithms, *Earth resources technology satellites, *Mapping, Mathematical models, Multispectral photography, Pattern recognition, Remote sensors.

For abstract, see STAR 1118

PB-223 176/9GA PC$9.50/MF$1.45
IBM Federal Systems Div., Gaithersburg, Md.
CARTOGRAPHIC AUTOMATIC MAPPING (CAM) PROGRAM DOCUMENTATION--VERSION 3,
P. Frederic Stepler. 6 Sep 73, 147p BGI-CD-74-1
For magnetic tape, see PB-223 177. Supersedes PB-191 779.

Descriptors: (*Automatic mapping, Programming manuals), Map projection, Procedure oriented languages, FORTRAN, Specifications.
Identifiers: CAM computer program, IBM 360 computers, Cartography, AUTOMAP system.

CAM is an IBM Systems 360 Fortran program that performs a wide variety of cartographic tasks. It will connect points with straight lines or great circles and draw line grids, range rings, ellipses, cones, symbols, azimuths and elevation rings. Included are 16 basic map projections that can be used to plot from a contained World Coastline file of 8,200 points or from World Data Bank I of 100,000 points separately contained on Accession No PB-223 178.

PB-223 177/7GA
Mag Tape $97.50;Foreign $122.50
IBM Federal Systems Div., Gaithersburg, Md.
CARTOGRAPHIC AUTOMATIC MAPPING (CAM) PROGRAM MAGNETIC TAPE-VERSION 3,
P. Frederic Stepler. 6 Sep 73, 2400 ft mag tape BGI-CT-74-2
For documentatiion, see PB-223 176. Supersedes PB-191 780.
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Automatic mapping, Magnetic tapes), Map projection, FORTRAN.
Identifiers: CAM computer program, IBM 360 computers, Cartography, AUTOMAP system.

CAM is an IBM Systems 360 Fortran program that performs a wide variety of cartographic tasks. It will connect points with straight lines or great circles and draw line grids, range rings, ellipses, cones, symbols, azimuths and elevation rings. Included are 16 basic map projections that can be utilized to plot from a contained World Coastline file of 8,200 points or from World Data Bank I of 100,000 points separately contained on Accession Number PB-223 178.

PB-223 178/5GA
Mag Tape $97.50;Foreign $122.50
IBM Federal Systems Div., Gaithersburg, Md.
WORLD DATA BANK I (WDB I).
29 Aug 73, 24 ft mag tape BGI-CT-74-3
Supersedes PB-209 560.
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Automatic mapping, Magnetic tapes), Map projection, FORTRAN.
Identifiers: World Data Bank, Cartography, CAM computer program, AUTOMAP system.

World Data Bank I (WDB I) is a digital representation of the coastlines and international boundaries of the world created for use in automated mapping systems. The first two files consist of approximately 100,000 individual coordinate points arranged sequentially to describe each linear feature. The third file is an index to the linear features in WDB I. This data bank can be used independently or in conjuction with the CAM Program, PB-223 176 (documentation) and PB 223 177 (tape), which will output these data in 16 basic map projections.

PB-223 179/3GA PC$4.25/MF$1.45
IBM Federal Systems Div., Gaithersburg, Md.
BUDAK PROGRAM DOCUMENTATION, -XY TO GEOGRAPHIC COORDINATES-VERSION 1,
P. Frederic Stepler. 6 Sep 73, 43p BGI-CD-74-4
For magnetic tape, see PB-223 180.

Descriptors: (*Automatic mapping, Programming manuals), Map projection, FORTRAN, Specifications.
Identifiers: BUDAK computer program, IBM 360 computers, Cartography, AUTOMAP system.

BUDAK is an IBM Systems 360 Fortran program that transforms X and Y data in counts per inch to latitude and longitude values. Map projections which can be inverted include the following: Mercator, Polar Stereographic, Lambert Conformal Conic with two standard parallels, Transverse Mercator Sphere, Transverse Mercator Spheroid and Kavraisky IV Conic Equal Interval. Program was originally used to create World Data Bank I (Accession No. PB-223 178) of the AUTOMAP System.

PB-223 180/1GA
Mag Tape $97.50; Foreign $122.50
IBM Federal Systems Div., Gaithersburg, Md.
BUDAK PROGRAM DOCUMENTATION, -XY TO GEOGRAPHIC COORDINATES-VERSION 1,
P. Frederic Stepler. 6 Sep 73, 2400 ft mag tape BGI-CT-74-5
For documentation, see PB-223 179.
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Automatic mapping, Magnetic tapes), Map projection, FORTRAN.
Identifiers: BUDAK computer program, IBM 360 computers, Cartography, AUTOMAP system.

BUDAK is an IBM Systems 360 Fortran program that transforms X and Y data in counts per inch to latitude and longitude values. Map projections which can be inverted include the following: Mercator, Polar Stereographic, Lambert Conformal Conic with two standard parallels, Transverse Mercator Sphere, Transverse Mercator Spheroid and Kavraisky IV Conic Equal Interval. Program was originally used to create World Data Bank I (Accession No. PB-223 178) of the AUTOMAP System.

8C. Dynamic Oceanography

AD-767 030/0GA PC$3.00/MF$1.45
Environmental Prediction Research Facility (Navy) Monterey Calif
STATE OF THE SEA AROUND TROPICAL CYCLONES IN THE WESTERN NORTH PACIFIC OCEAN,
Samson Brand, Jack W. Blelloch, and Donald C. Schertz. Jun 73, 26p Rept no. ENVPREDRSCHFAC-tech-paper-5-73

Descriptors: (*Tropical cyclones, *Pacific Ocean), Ocean waves, Surface roughness, Regression analysis.
Identifiers: *Sea states, North Pacific Ocean, Hurricanes, Typhoons, Air water interactions.

The combined sea-height data for the year 1971 for the western North Pacific Ocean are examined to determine the sea-state characteristics around tropical storms and typhoons. The results from subjectively analyzed sea-state charts show that the areal extent about the storms of the combined sea height in the 9-15 ft range is primarily a function of storm duration, intensity (maximum sustained wind) and size. Equations derived by linear regression techniques are presented for describing the state of the sea about tropical cyclones. (Author)

AD-767 047/4GA PC$9.75/MF$1.45
Texas A and M Research Foundation College Station
AN INVESTIGATION OF THE INTERACTION BETWEEN THE GULF STREAM AND THE NEW ENGLAND SEAMOUNT CHAIN. DATA REPORT.
Technical rept.,
Andrew C. Vastano, and Bruce A. Warren. Jun 73, 515p Rept no. A/M-Ref-73-8-T
Contract N00014-68-A-0308-0002
Prepared in cooperation with Woods Hole Oceanographic Inst., Contract N00014-66-C-0241.

Descriptors: (*Gulf stream, Oceanographic data), Ocean bottom topography, Depth finding, Pressure, Temperature, Salinity, Sound transmission, Potential energy, Atlantic Ocean, Underwater sound, Tables.
Identifiers: Seamounts, New England, Bathymetry, Acoustic velocity.

The data compiled in the report were collected on the twenty-second research cruise of R. V. KNORR, Woods Hole Oceanographic Institution, E. H. Hiller, master and bears on the interaction of the Gulf Stream and the New England Seamount Chain. The field project was conducted in three separate phases: (1) a rapid survey with expendable bathythermographs (XBT's) to locate and trace the path of the Gulf Stream; (2) the deployment of seven current meters in single meter moorings along a line perpendicular to the indicated Gulf Stream track upstream of the seamount chain, 200 meters off the bottom at depths of approximately 4800 meters; and (3) a hydrographic survey in the vicinity of the Kelvin and Atlantis II seamounts. In all, 211 XBT's were taken and 111 STD stations (with water samples) were occupied during the cruise. The bathymetry, read from fathometer records, was corrected for local variations in the vertical distribution of sound velocity.

AD-767 120/9GA Reprint
Woods Hole Oceanographic Institution Mass
INTERNAL SWASH AND SURF.
Technical rept.,
K. O. Emery, and C. G. Gunnerson. 29 May 73, 5p
Rept nos. WHOI-73-56, WHOI-Contrib-3123
Contract N00014-66-C-0241
Availability: Pub. in the Proceedings of the National Academy of Sciences, v70, n8 p2379-2380 Aug 73.

Descriptors: (*Ocean waves, Continental shelves), Bathythermograph data, Ocean currents, Pacific Ocean, California.
Identifiers: Internal waves, Santa Monica Bay, Sediment transport, Suspended sediments, Submarine canyons.

Data consisting of 114 temperature sections, each containing an average of 10 bathythermograms, show that internal waves commonly become altered on crossing the shoaling bottom of the continental shelf in Santa Monica Bay, California. The alteration takes the form of internal swash (in which the lower isotherms reach farther landward than would be expected from their depth above the outer shelf or above deeper bottom) and of internal surf (that is, denoted by temperature inversions, isolated boluses of colder water at the bottom, and complex short wave-length variations of isotherms). (Author)

AD-767 183/7GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
M2 TIDAL CURRENTS IN THE WESTERN NORTH ATLANTIC,
Ronald Regal, and Carl Wunsch. 18 Dec 72, 13p
Contract N00014-67-A-0204-0047, Grant NSF-GA-24177
Prepared in cooperation with Woods Hole Oceanographic Institution, Mass. Rept. no. WHOI-Contrib-2998, under contract N00014-66-C-0241. Revision of report dated 19 Sep 72.
Availability: Pub. in Deep-Sea Research, v20 p493-502 1973.

Descriptors: (*Ocean currents, *Atlantic Ocean), Tides, Velocity, Deep water, Statistical data, Tables.
Identifiers: North Atlantic Ocean.

A number of current meter records collected by the Woods Hole Oceanographic Institution have been examined to determine the structure of M2 tides in the western North Atlantic. Though the signal to noise ratio is low, a simple picture emerges when sufficiently many records are averaged. At a site north of the Gulf Stream, the tidal current is baroclinic, and concentrated near the surface. The result is consistent with generation of internal tides along the continental slope just to the north. At positions south of the Gulf Stream, the records are too few to conclude more than that the tidal velocities are consistent with high mode internal waves. (Author)

AD-767 432/8GA Reprint
Rhode Island Univ Kingston Graduate School of Oceanography
GULF STREAM EDDIES: RECENT OBSERVATIONS IN THE WESTERN SARGASSO SEA,
P. L. Richardson, A. E. Strong, and J. A. Knauss.
22 Jan 73, 8p Rept no. Ref-73-8
Contract N00014-68-A-0215-0003
Revision of report dated 15 Dec 72.
Availability: Pub. in Jnl. of Physical Oceanography, v3 n3 p297-301 Jul 73.

Descriptors: (*Gulf stream, Vortices), Life expectancy, Infrared photography, Scientific satellites, Oceanographic data.
Identifiers: *Sargasso Sea, *Eddies, Remote sensing.

A cyclonic Gulf Stream eddy was observed in the western Sargasso Sea by satellite infrared measurements and later confirmed by ship measurements. Fourteen months of observations indicate that the eddy moved southwestward at an average rate of 1 mi/day. The evidence suggests that the eddy was absorbed by the Gulf Stream off Florida. (Author)

COM-73-11422/5GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
THE USE OF SKYWAVE RADAR FOR REMOTE SENSING OF SEA STATES,
Donald E. Barrick. 1973, 6p NOAA-73081208
Pub. in Marine Technology Society Jnl., v7 n1 p29-33 Jan/Feb 73.

Descriptors: (*Sea states, Remote sensing), Radar echoes, High frequencies, Backscattering, Spectrum analysis.

The author suggests the use of shore-based HF radars which propagate via ionospheric reflections (i.e., 'skywave' radars) appears to be an ideal solution to the problem of wide-area routine sea-state monitoring. The problem now lies in establishing and verifying the relationship between the observed sea-scatter signal spectrum and the ocean-wave directional spectrum.

COM-73-11440/7GA Reprint
Johns Hopkins Univ., Baltimore, Md.
TURBULENCE FROM BREAKING OF INTERNAL GRAVITY WAVES,
Robert R. Long. 1972, 7p NOAA-73081705
Grants ESSA-E22-15-69(G), ESSA-E22-36-69(G)
Pub. in Conseil International pour L'Exploration de La Mer - Extrait des Rapports et Proces-Verbaux, v162 p13-18 1972.

Descriptors: (*Ocean waves, Gravity waves), (*Atmospheric motion, Turbulence), Turbulent boundary layer, Heat transmission, Eddies.
Identifiers: Internal gravity waves.

The paper discusses small-scale turbulence resulting from the breaking of internal gravity waves. The viewpoint that these waves can grow large enough to break is adopted, even in regions of large Richardson number, provided there is a source of wave disturbances either from mountains or hills or moving frontal surfaces in the atmosphere or eddies in the turbulent boundary layers of the atmosphere or oceans. In addition, there appears to be some process which tends to create thin layers in the atmosphere and oceans with large density and velocity differences across the layers. These regions tend to break down into strong turbulence from Kelvin-Helmholtz instability. A theory is discussed which relates to the occurrence of weak, sporadic turbulence in layers of large Richardson number in which the disturbances arise from eddies at the boundaries of these layers. (Modified author abstract)

COM-73-11466/2GA PC$4.25/MF$1.45
University of Southern California, Los Angeles. Allan Hancock Foundation.
MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART I: CIRCULATION PATTERNS IN LOS ANGELES-LONG BEACH HARBOR DROGUE STUDY ATLAS AND DATA REPORT,
Dorothy F. Soule, and Mikihiko Oguri. 19 Dec 72, 116p USC-SG-6-72 NOAA-73032604
See also Part 2, COM-73-11467.

Descriptors: (*Ecology, San Pedro Bay), (*San Pedro Bay, Circulation), California, Harbors, Maps, Tables(Data), Water pollution.
Identifiers: Sea Grant program.

The report presents reduced data from a drogue study carried out on June 13-14, 1972, by the Allan Hancock Foundation, University of California, in cooperation with public agencies and private industry. Data is presented for each of the 47 drogues for which adequate sightings were obtained. Each data sheet is accompanied by a computer plot of the drogue track in the harbor. Summary plots of all drogues released in the morning, on the afternoon, at the surface, at ten foot depths or at twenty foot depths are presented as are plots of the net movements of one morning drogue and one afternoon drogue from each station for each depth.

N73-27323/7GA PC$3.00/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Cronulla (Australia).
GEOPOTENTIAL TOPOGRAPHIES AND CURRENTS OFF WEST AUSTRALIA, 1965-1969.
B. V. Hamon. 1972, 13p CSIRO-DFO-TP-32, ISBN-0-643-00012-7

Descriptors: *Australia, *Geopotential height, *Ocean currents, *Ocean surface, Abnormalities, Periodic variations, Topography.

For abstract, see STAR 1118

8D. Geochemistry

N73-28439/0GA PC$3.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
AMINO ACIDS CONTAINED IN THE CENOZOIC FORMATIONS OF JAPAN.
Y. Chihara. Jul 73, 28p NASA-TT-F-15002
Contract NASW-2481
Tran-Transl. Into English from Chikyu Kagaku (Tokyo), V. 26, No. 2, Mar. 1972 p 69-79.

Descriptors: *Amino acids, *Concentration (Composition), *Paleontology, Bibliographies, Geochronology, Japan.

For abstract, see STAR 1119

8E. Geodesy

AD-767 313/0GA PC$3.50/MF$1.45
Ohio State Univ Columbus Dept of Geodetic Science
NUMERICAL RESULTS FROM THE COMBINATION OF GRAVIMETRIC AND SATELLITE DATA USING THE PRINCIPLES OF LEAST SQUARES COLLOCATION,
Richard H. Rapp. Mar 73, 65p Rept nos. DGS-200, Scientific-7 AFCRL-TR-73-0195
Contract F19628-72-C-0120

Descriptors: (*Gravity, Measurement), Least squares method, Anomalies, Potential energy, Mathematical models, Orbital trajectories, Perturbation theory, Satellites(Artificial), Tables.
Identifiers: Gravimetric geodesy, Geodetic satellites, Gravity anomalies.

The report develops working equations for carrying out the combination of gravimetric and satellite data starting from the equations of Moritz, and using the principles of the usual least squares adjustment and the least squares collocation. Of the two methods of combining data considered, one could not be carried out because of the need to invert a 1654 x 1654 full matrix. Numerical tests were conducted through the estimation of ten sets of potential coefficients complete to degree 20 plus certain resonance coefficients which have been derived starting from the GEM 3 potential coefficients and a 5 degree equal area block anomaly field. The solutions differ in two ways: first, the weighting applied to the a priori known potential coefficients, and second whether the usual least squares or collocation adjustment scheme is used for the estimation of the potential coefficients. To determine a best overall set of potential coefficients, comparisons have been made with astro-geodetic undulations (4196 values in Australia and the United States); with 5 degree anomalies; with anomaly degree variances, and by use of the coefficient sets in orbit fitting and prediction. Such comparisons indicate that collocation derived potential coefficients yield better values than those found using the usual least squares approach. A recommended set of potential coefficients and a consistent 5 degree equal area block anomaly field are given. (Author)

AD-767 592/9GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
SOME COMMENTS ON THE CHARGED PARTICLE TECHNIQUE FOR MEASURING ABSOLUTE GRAVITY.
Physical sciences research papers,
James A. Hammond. 18 Jul 73, 15p Rept nos.
AFCRL-TR-73-0425, AFCRL-PSRP-555

Descriptors: (*Gravity, Measurement), Charged particles, Particle trajectories, Errors, Drag, Electric fields.
Identifiers: *Gravimeters.

Comments are made on several possible sources of systematic error inherent in the charged particle technique of measuring absolute gravity. It is shown that the effects of air flow and electric fields are potentially large enough that the difficulty of eliminating or measuring the effects forces the conclusion that the charged particle technique is not applicable in a practical sense to the measurement of absolute gravity at this time. (Author)

E73-11032/GA PC$7.25/MF$1.45
Utah Univ., Salt Lake City. Dept. of Geological and Geophysical Sciences.
FRACTURE TRENDS IDENTIFED BY ERTS-1 IMAGERY IN UTAH AND NEVADA,
Mead L. Jensen, M. P. Erickson, and M. R. Smith. 24 Aug 73, 102p NASA-CR-133880
Contract NAS5-21883

Descriptors: Utah, Nevada, Mineral exploration, Structural properties(Geology), Geological faults, Earth resources program, Fracturing, Volcanology, Mercury(Metal).

The author has identified the following significant results. In the Utah-Nevada area, linear structural trends recorded on ERTS-1 imagery conform in part to previously recognized structures. In addition, the ERTS-1 imagery reveals cryptic structures not previously identified and not readily apparent in other imagery. These structures are illustrated by prominent east-west trending structures which appear to be concentrated in pre-volcanic rocks. This suggests that the structures are older than many of those with other trends which are equally prominent in volcanic and non-volcanic terrain. Since the older east-west structures may have controlled early Tertiary emplacement of magma or the ascent of mineralizing fluids, their recognition is important in mineral exploration. Soil-gas sampling and analysis for mercury content is being continued over structures, and projected trends of buried structures which appear, from studies of ERTS-1 imagery, to be favorable to mineralization. Comparison of ERTS-1 and Skylab imagery indicated that ERTS-1 imagery records more previously unrecognized linear structures than the Skylab imagery. In differentiating and identifying different rock types, the Skylab imagery appears to be more effective.

N73-27334/4GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EARTH'S ISOSTATIC GRAVITY ANOMALY FIELD: CONTRIBUTIONS TO NATIONAL GEODETIC SATELLITE PROGRAM.
M. A. Khan. Jun 73, 33p NASA-TM-X-66292, X-592-73-199
Subm-Submitted for Publication.

Descriptors: *Gravity anomalies, *Harmonic functions, *Isostasy, *Tables (Data), Mass distribution, Power spectra, Terrain analysis.

For abstract, see STAR 1118

N73-27336/9GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SIMULTANEOUS OBSERVATION SOLUTIONS FOR NASA-MOTS AND SPEOPT STATION POSITIONS ON THE NORTH AMERICAN DATUM.
J. S. Reece, and J. Marsh. Jun 73, 29p NASA-TM-X-66297, X-592-73-170
Subm-Submitted for Publication.

Descriptors: *Minitrack system, *North america, *Satellite tracking, *Tracking networks, Geos 1 satellite, Geos 2 satellite, Numerical analysis, Systems engineering, Tracking stations.

For abstract, see STAR 1118

N73-27337/7GA PC$4.25/MF$1.45
California Inst. of Tech., Pasadena.
GRAVITATIONAL-WAVE OBSERVATIONS AS A TOOL FOR TESTING RELATIVISTIC GRAVITY.
D. M. Eardley, D. L. Lee, and A. P. Lightman. Jun 73, 44p NASA-CR-133411, OAP-325
Contracts NGR-05-002-256, NSF GP-36687X

Descriptors: *Far fields, *Gravitation, *Gravitational waves, Astronomy, Lorentz transformations, Polarization (Waves), Solar system.

For abstract, see STAR 1118

N73-28130/5GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A GLOBAL STATION COORDINATE SOLUTION BASED UPON CAMERA AND LASER DATA - GSFC 1973.
J. G. Marsh, B. C. Douglas, and S. M. Klosko. May 73, 71p NASA-TM-X-70422, X-592-73-171
Conf-Presented at the 1ST Intern. Symp. On the Use of Artificial Satellites for Geodesy and Geodyn., Athens, 14-21 May 1973.

Descriptors: *Data acquisition, *Geodetic coordinates, *Global tracking network, Cameras, Geocentric coordinates, Lasers.

For abstract, see STAR 1119

N73-28444/0GA PC$4.75/MF$1.45
California Inst. of Tech., Pasadena.
A NEW TWO-METRIC THEORY OF GRAVITY WITH PRIOR GEOMETRY.
A. P. Lightman, and D. L. Lee. 1972, 54p
Contracts NGR-05-002-256, NSF GP-36687X

Descriptors: *Gravimetry, *Gravitation theory, Gravitational constant, Gravitational fields, Gravitational waves, Newton theory, Polarization (Waves).

For abstract, see STAR 1119

PB-223 635/4GA PC$3.75/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
THEORY FOR THE COMPARISON OF TWO FUNCTIONS,
Mohammad Asadullah Khan. May 71, 32p HIG-71-1

Descriptors: (*Gravimetric geodesy, Correlation), (*Potential theory, Gravimetric geodesy), Spherical harmonics, Orthogonal functions, Graphic methods.

The theory of comparison of the degree spectra of two functions is given. Novel correlation parameters for comparing the identical frequencies in the composite representations of the two functions are introduced. (Author)

PB-223 646/1GA PC$6.75/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
THE EARTH'S GRAVITY FIELD FROM A COMBINATION OF SATELLITE AND TERRESTRIAL GRAVITY DATA.
Doctoral thesis,
Larry Delano Beers. Dec 71, 93p HIG-71-18

Descriptors: (*Gravimetric geodesy, Gravity reduction), Gravity anomalies, Spherical harmonics, Geopotential, Least squares method, Fourier analysis, Power spectra, Theses.

The long-wavelength components of the Earth's gravity field to the 8th harmonic degree obtained from artificial earth-satellite data are combined with 5 degree x 5 degree mean gravity anomalies obtained from 1 degree x 1 degree mean gravity anomalies computed from gravimetric data. The expected relationship between the data is used to construct an 'areal function'. Variations in this function are estimated by the least-squares method. Nine hundred ninety-nine unknown anomalies are computed. The maximum standard error of unit weight is plus or minus 5.1 mgal. The resultant anomalous gravity field is expressed in terms of spherical harmonic coefficients of geopotential to the 21st harmonic degree to facilitate comparisons with other solutions. The method uses the strength of both the satellite gravity solutions and the gravimetric data. The spectra of the new solution compare favorably with the power spectra of other available satellite and/or combination solutions.

8F. Geography

COM-73-11537/0GA PC$3.00/MF$1.45
Delaware Univ., Newark. Coll. of Marine Studies.
COASTAL VEGETATION OF DELAWARE. THE MAPPING OF DELAWARE'S COASTAL MARSHES,
V. Klemas, F. C. Daiber, D. S. Bartlett, O. W. Crichton, and A. O. Fornes. Mar 73, 31p DEL-SG-15-73 NOAA-73080813
Contract N00014-69-A-0407, NOAA-2-35223
Sponsored in part by National Science Foundation, Washington, D.C. Grant NSF-GI-33369.

Descriptors: (*Coasts, Infrared mapping), (*Swamps, Vegetation), (*Delaware, Coasts), Plant ecology, Grasses, Plants(Botany), Evaluation, Classifications, Maps, Aerial photography.
Identifiers: Sea Grant program, Coastal wetlands.

A baseline mapping project was undertaken in Delaware's coastal wetlands as a prelude to an evaluation of the relative value of different parcels of marsh and the setting of priorities for use of these marshes. The mapping approach used relied heavily on aerial photography and multispectral analysis, using conventional ground reconnaissance only to aid and check the photo-interpretation. The fifteen maps included show the dominant species or groups of species of vegetation present. Five categories are identified: (1) salt marsh cord grass (Spartina alterniflora); (2) salt marsh hay and spike grass (Spartina patens and Distichlis spicata); (3) reed grass (Phragmites communis); (4) high tide bush and sea myrtle (Iva species and Baccharis halimifolia); and (5) a group of freshwater species found in impounded areas built to attract water fowl. Major secondary species are indicated where appropriate.

E73-10969/GA PC$3.00/MF$1.45
Democritus Nuclear Research Center, Athens (Greece).
LAND USE, FOREST DENSITY, SOIL MAPPING, EROSION, DRAINAGE, SALINITY LIMITATIONS.
Bimonthly progress rept. 1 Dec 72-31 Jan 73,
N. J. Yassoglou. 31 Jan 73, 10p NASA-CR-133748

Descriptors: Land use, Forests, Erosion, Soil mapping, Drainage, Salinity, Greece, Earth resources program, Agriculture, Crop identification, Mapping.

The author has identified the following significant results. The results of analyses show that it is possible to obtain information of practical significance as follows: (1) A quick and accurate estimate of the proper use of the valuable land can be made on the basis of temporal and spectral characteristics of the land features. (2) A rather accurate delineation of the major forest formations in the test areas was achieved on the basis of spatial and spectral characteristics of the studied areas. The forest stands were separated into two density classes; dense forest, and broken forest. On the basis of ERTS-1 data and the existing ground truth information a rather accurate mapping of the major vegetational forms of the mountain ranges can be made. (3) Major soil formations are mapable from ERTS-1 data: recent alluvial soils; soil on quarternary deposits; severely eroded soil and lithosol; and wet soils. (4) An estimation of cost benefits cannot be made accurately at this stage of the investigation. However, a rough estimate of the ratio of the cost for obtaining the same amount information from ERTS-1 data and from conventional operations would be approximately 1:6 to 1:10, in favor of the ERTS-1.

E73-10987/GA PC$3.75/MF$1.45
Ohio Dept. of Development, Columbus.
RELEVANCE OF ERTS TO THE STATE OF OHIO.
Progress rept. Jul-Aug 73,
David C. Sweet. Aug 73, 33p NASA-CR-133766
Contract NAS5-21782
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. Dak. 57198.

Descriptors: Ohio, Resources management, Management planning, Earth resources program, Land use, Image enhancement, Strip mining.

The author has identified the following significant results. A significant result was the fabrication of an image transfer and comparison device. To avoid problems and high costs encountered in manual drafting methods, Battelle staff members have fabricated an inexpensive, yet effective, technique for transferring ERTS-1 analysis displays from the Spatial Data 32-Color Viewer to maps and/or aircraft imagery. In brief, the image transfer-comparison device consists of a two-way mirror which functions similar to a zoom transfer scope. However, the device permits multiuser viewing and real time photographic recording (35mm and Polaroid) of enhanced ERTS-1 imagery superimposed over maps and aircraft photography. Photographs (35mm, 70 mm, and 4x5 in) are taken of 80% of the TV screen of the Spatial Data Density Slicing Viewer. The resulting black and white and color imagery is then used in transparent overlays, viewgraphs, 35mm and 70mm transparencies, and paper prints for reports and publications. Annotations can be added on the TV screen or on the finished product.

E73-11005/GA PC$3.00/MF$1.45
Kansas Univ./Center for Research, Inc., Lawrence.
INTERPRETATION OF LAND USE AND STREAM ORDER, PAWNEE RIVER BASIN, KANSAS,
S. A. Morain, and Donald L. Williams. 14 Sep 73, 6p NASA-CR-133798
Contract NAS5-21822

Descriptors: Land use, Drainage, Patterns, Streams, Kansas, Earth resources program, Photointerpretation, Rangelands, Irrigation, Vegetation.

The author has identified the following significant results. Land use and stream orders were mapped from ERTS-1 imagery covering the Pawnee River Basin. Total area of the basin, irrigated dry land crop area, and rangeland area were determined. The stream order of the basin was calculated by the Strahler method and provided more detail than is available on the comparable 1:250,000 sheets. This study has demonstrated the feasibility of using ERTS-1 imagery to map stream networks in greater detail than is required for 1:250,000 scale. The utility of ERTS-1 has also been demonstrated for mapping and mensuration of data relating to performance of ground cover types and the extent of irrigation.

E73-11021/GA PC$3.00/MF$1.45
Oregon State Univ., Corvallis. Rangeland Resources Program.
INVENTORY AND MONITORING OF NATURAL VEGETATION AND RELATED RESOURCES IN AN ARID ENVIRONMENT: A COMPARATIVE EVALUATION OF ERTS-1 IMAGERY.
Progress rept. 1 Mar-31 Aug 73,
Barry J. Schrumpf, James R. Johnson, David A. Mouat, and William T. Pyott. 20 Sep 73, 14p NASA-CR-133818
Contract NAS5-21831

Descriptors: Vegetation, Satellite-Borne photography, Arizona, Arid lands, Plants(Botany), Earth resources program, Spectral signatures, Photointerpretation.

The author has identified the following significant results. A comparative evaluation of an ERTS-1 MSS color reconstitution and an Apollo 6 and Gemini 4 color photograph for information content was conducted. A greater variety of image detail was indicated for the Apollo 6 imagery. A study of terrain feature variable-vegetation relationships has been concluded. However, there were no substantial differences among space photo types when macrorelief classes were interpreted. Vegetation distribution is influenced in varying degrees by characteristics of the terrain, some of which are quite apparent on ERTS-1 imagery and, therefore, provide the means for inferring possible vegetation types for a specified location. Spectral signatures have been determined for some natural vegetation system from the ERTS-1 MSS data. Those signatures have been used to classify ERTS-1 data for a portion of the study area. Work continues on multistage sampling for natural vegetation, terrain feature identification of ERTS-1 photographs, plant phenology, and spectral signature studies.

N73-27318/7GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
SPACE METHODS IN GEOGRAPHY.
B. V. Vinogradov. Jul 73, 18p NASA-TT-F-14973
Contract NASW-2485
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Ser. Geogr. (Moscow), No. 3, 1972 p 79-89.

Descriptors: *Equipment specifications, *Remote sensors, Information systems, Mapping, Terrain analysis, Topography.

For abstract, see STAR 1118

N73-27320/3GA PC$3.50/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
SEVERAL PROPERTIES OF THE RADIOEMISSION OF LAND SURFACES.
A. S. Gurvich. Jul 73, 30p NASA-TT-F-14978
Contract NASW-2482
Tran-Transl. Into English of "Nekotoryye Osobennosti Radioizlucheniya Zemnykh Pokrovov", Acad. Of Sci. Ussr, Inst. Of Space Res., Moscow, Report Presented at Meeting of the Sov.-AM. Working Group on Remote Sensing of Natural Environment from Space, 12-17 Feb. 1973 31 p.

Descriptors: *Cosmos satellites, *Land, *Radio emission, *Surface properties, Antarctic regions, Soils, U.s.s.r..

For abstract, see STAR 1118

N73-28440/8GA PC$4.75/MF$1.45
Scientific Translation Service, Ann Arbor, Mich.
AEROMETHODS OF GEOGRAPHICAL RESEARCH.
L. A. Bogomolov, and E. M. Pospelov. Jul 73, 54p NASA-TT-F-14966
Contract NASW-2483
Tran-Transl. Into English of the Publ. "Aerometody Geograficheskikh Issledovaniy" Moscow, Geograph. Soc. Of the USSR, 1972 p 1-39.

Descriptors: *Aerial photography, *Geography, *Spaceborne photography, Earth resources, Photogrammetry, Photographic film, Systems analysis, Topography, U.s.s.r..

For abstract, see STAR 1119

8G. Geology and Mineralogy

AD-767 053/2GA PC$3.00/MF$1.45
Terra Tek Inc Salt Lake City Utah
PRELIMINARY OBSERVATIONS OF THE MICROSTRUCTURE OF NEVADA TEST SITE TUFFS.
Final rept.,
H. S. Swolfs, H. R. Pratt, S. J. Green, and A. H. Jones. Aug 73, 32p Rept no. TR-73-32 DNA-3176F
Contract DNA001-73-C-0017

Descriptors: (*Rock(Geology), Microstructure), Porosity, Nevada, Compacting.
Identifiers: *Nevada Test Site, Tuff, Pumice.

Nevada Test site tuffs contain pores that range in size from several millimeters to 10 to the minus seventh power millimeters (angstrom) in diameter. Optical observation of thin sections and scanning electron microscope pictures show the pores to be distributed within pumice and crystal fragments, at the intersection of grain boundaries, and within the glassy matrix. While many of the larger pores are connected, many of the small pores (less than 0.001 millimeters in size) are occluded. Because of the variation in pore sizes, ordinary methods of determining wet, dry, and grain densities will not give total porosity, percent saturation and percent unfilled voids with a high degree of accuracy and precision. Furthermore, compaction of the tuffs will occur by collapse of pores of different sizes at different stress states, with some pores not closing until extremely high stresses. (Author)

AD-767 089/6GA PC$3.00/MF$1.45
Institute for Telecommunication Sciences Boulder Colo
SOURCE-TO-OBSERVER DISTANCE DEPENDENCE OF THE SURFACE IMPEDANCE AND WAVE TILT FOR A LINE-SOURCE EXCITED TWO-LAYER EARTH.
Technical rept.,
James R. Wait, and Kenneth P. Spies. 4 Sep 73, 50p Rept no. TR-6
Contract NAonr-15-71
Prepared in cooperation with Cooperative Inst. for Research in Environmental Science, Boulder, Colo.

Descriptors: (*Geophysical prospecting, Electromagnetic waves), Field theory, Integral equations, Integration, Mathematical models.
Identifiers: Numerical integration.

The integral representations for the field components are evaluated numerically and compared with often used asymptotic formulas. It is found that the latter have a limited range of validity when the substratum is highly resistive. In general, the distance to the source cable must be allowed for in the interpretation of the observed fields. Numerical results for the relevant parameters are included. (Author)

AD-767 143/1GA Reprint
Rhode Island Univ Kingston Graduate School of Oceanography
EXTENT AND FORMATION OF DEEPLY BURIED CHANNELS ON THE CONTINENTAL SHELF OFF SOUTHERN NEW ENGLAND,
Robert L. McMaster, and Asaf Ashraf. 8 Dec 72, 11p Rept no. Ref-73-6
Contract N00014-68-A-0215-0003
Revision of report dated 25 Aug 72.
Availability: Pub. in the Jnl. of Geology, v81 n7 p374-379 1973.

Descriptors: (*Continental shelves, Marine geophysics), Glaciers, Marine geology, Long Island Sound, Rhode Island.
Identifiers: Seismic reflection method, Seismic profiles.

Seismic reflection profiles reveal a network of deeply buried channels that extends from coastline buried bedrock valleys to some 50 km off Rhode Island. Thalwegs below sea level reach 100-286 m in Coastal Plain deposits. The limited extent, depth, and longitudinal profiles of these channels together with the seaward lobate boundary of the channel pattern suggest severe ice scour modifications of late Tertiary-early Pleistocene preglacial river valleys. Maximum ice advance is correlated with a pre-Woodfordian ice margin of the Wisconsin stage. (Author)

AD-767 162/1GA Reprint
Texas A and M Univ College Station Dept of Oceanography
ULTRABASIC ROCKS FROM THE CAYMAN TROUGH, CARIBBEAN SEA,
David H. Eggler, D. A. Fahlquist, W. E. Pequegnat, and J. M. Herndon. 29 Jan 73, 7p
Contract N00014-68-A-0308-0002
Sponsored in part by National Science Foundation, Washington, D.C. Prepared in cooperation with Geophysical Lab., Washington, D.C. Revision of report dated 25 Sep 72.
Availability: Pub. in Geological Society of America Bulletin, v84 p2133-2138 Jun 73.

Descriptors: (*Rock(Geology), *Ocean bottom), (*Caribbean Sea, *Ocean bottom sampling), Basalt, Petrography, Structural geology.
Identifiers: Ultrabasic rocks, Serpentinite, *Cayman Trough, Seismic profiles, Bathymetry.

Ultrabasic rocks have been dredged from the center of the Cayman Trough, a postualted boundary between the North American and Caribbean plates, 160 km southwest of Grand Cayman Island. Serpentinite, which may be altered spinel lherzolite, dominates the collection and is believed to be bedrock in the station area. Two samples of a clinopyroxene-plagioclase-ilmenite crystal cumulate were found. (Author)

AD-767 173/8GA Reprint
Colorado State Univ Fort Collins Dept of Geology
IMPLICATIONS OF COMPLEX RESPONSE OF SYSTEMS FOR QUATERNARY ALLUVIAL STRATIGRAPHY,
Stanley A. Schumm, and Randolph S. Parker. 26 Mar 73, 6p AROD-8525:3-EN
Grant DA-ARO-D-31-124-70-G13
Availability: Pub. in Nature Physical Science, v243 n128 p99-100, 11 Jun 73.

Descriptors: (*Inland waterways, Erosion), Deposition, Terrain models, Sedimentation.
Identifiers: Evolution(Development), Watersheds, *Geomorphology, Surface water runoff, Valleys, Alluvium.

Experimental and field evidence indicates that a drainage system will respond in a complex fashion to rejuvenation. The sequence at a given cross section is as follows: (1) channel incision and terrace formation, (2) channel widening followed by deposition as upstream erosion increases, (3) incision of the new alluvial deposit and formation of a secondary terrace, as upstream erosion decreases. This complex response of a drainage system provides an explanation for the difficulty in obtaining good correlations of Holocene alluvial deposits and terraces and of the behavior of modern arroyos. (Author)

AD-767 246/2GA PC$2.75/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
GROUND RESISTIVITY SURVEY IN AREA OF TENNESSEE. TOMBIGBEE WATERWAY.
Special rept.,
Pieter Hoekstra, and Allan J. Delaney. Aug 73, 22p Rept no. CRREL-SR-191

Descriptors: (*Geophysical prospecting, Mississippi), Airborne, Sedimentary rock.
Identifiers: Resistivity exploration, Tennessee Tombigbee Waterway.

Electrical resistivity measurements were made on the ground in the area of the proposed Tennessee Tombigbee Waterway in the vicinity of Fulton, Mississippi. The objective of the project was to determine if electrical resistivity surveys could be used to advantage in exploration required for the canal section. In general in this area a layer of fine-grained material overlies sands and gravels. In most of the area a bentonitic layer is situated at a depth from 10 to 90 ft below the surface. The conclusion was reached that an airborne resistivity survey would probably map the fine-grained top layer within classes of 0-1 m, 1-5 m, and more than 5 m thick. Clean, extensive gravel layers would also be detected. (Author)

AD-767 437/7GA PC$3.75/MF$1.45
Georgia Tech Research Inst Atlanta
NEW TECHNIQUE AND INDICATORS FOR STUDIES OF GROWTH HISTORY OF ZONED CRYSTALS.
Final rept. 1 Nov 69-30 Sep 73,
Charles O. Pollard, Jr. 31 Aug 73, 87p* Rept no. GIT-A1409-8
Contract DAHC04-70-C-0012, Grant DA-ARO-D-31-124-71-G64
Sponsored in part by Grant DA-ARO-D-31-124-72-G41.

Descriptors: (*Crystal structure, *X-ray diffraction analysis), (*Minerals, X-ray diffraction analysis), Crystal growth, Colors, Tourmaline, Quartz, Twinning(Crystallography).

Two X-ray diffraction imaging techniques have been applied for the first time to the study of previously unnoted mosaic detail in color-zoned Brazilian tourmaline. The divergence source-image distortion (DSID) technique gives maximum values for misorientations among all observable grains, whereas the convergence source-image distortion (CSID) technique yields the magnitude of misorientation between adjacent grains. Strikingly abrupt textural changes are observed; they are always accompanied by color changes. The converse is not found to hold. The central or core region of all five plates studied shows a macromosaic texture. No grain elongation is observed. AT-cut quartz crystals can be made to Dauphine twin by torsion at above 600C, such that the twin boundaries assume veil-like shapes with steps, except where they correspond to pre-existing growth horizon boundaries. Strain rate controls and recording are needed to exclude problems with fracturing. (Author)

CEA-R-4422/GA PC$5.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
GAMMA SPECTROMETRY WITH GE(LI) SEMICONDUCTORS IN DRILLING OPERATIONS. APPLICATION TO ESTIMATIONS OF THE QUANTITY OF U CONTAINED IN ROCKS.
C. Andrieux. 1973, 75p
In French. U.S. Sales Only.

Descriptors: (*Uranium, *Gamma spectroscopy), (*Uranium ores, *Chemical analysis), Li-drifted ge detectors, Quantitative chemical analysis, Rocks.

For abstract, see NSA 28 03, number 05188.

CONF-721010-70/GA PC$3.25/MF$1.45
RADIOGRAPHIC METHODS IN THE ANALYSIS OF B, LI, RA, U, AND TH IN MINERALS AND ORES.
G. N. Flerov, and I. G. Berzina. 1972, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Boron, *Autoradiography), (*Lithium, Autoradiography), (*Radium, Autoradiography), (*Uranium, Autoradiography), Activation analysis, Chemical analysis, Dielectric track detectors, Distribution, Geochemistry, Minerals, Neutron radiography, Ores, Particle tracks, Rocks, Sensitivity, Thorium.

For abstract, see NSA 28 02, number 02101.

E73-10992/GA PC$3.00/MF$1.45
Utah Univ., Salt Lake City. Dept. of Geological and Geophysical Sciences.
GEOLOGICAL AND GEOCHEMICAL STUDIES IN THE ROBINSON MINING DISTRICT, WHITE PINE COUNTY, NEVADA, USING SKYLAB S190A IMAGERY.
Quarterly rept.,
M. L. Jensen, R. J. Rogers, and M. P. Erickson. 1 Aug 73, 5p NASA-CR-133771
Contract NAS9-13322

Descriptors: Nevada, Geological surveys, Geochemistry, Multispectral photography, Mines(Excavations), EREP, Skylab program, Magnetic anomalies, Volcanology, Multispectral band cameras, Mineral exploration, Copper, Temperature measurement.

The author has identified the following significant results. In the Robinson mining district which includes the Ruth porphyry copper mines, three large positive aeromagnetic anomalies exist over a Tertiary volcanic area north west of Ruth. Prior studies of this area have suggested that the volcanics may or may not be the cause of the anomalies. Skylab S190A imagery, however, indicates possible outcrops in the volcanic area of the Paleozoic sediments. Field studies or ground truth

verify the existence of these inliers suggesting that the magnetic anomaly may be the result of a buried intrusive body for which potential mineralization has been covered by the post-ore blanket of volcanics. The area is being mapped in more detail and samples of mercury-bearing soil-gas are being collected within and outside the area.

E73-11020/GA PC$3.50/MF$1.45
Geological Survey, Washington, D.C.
IRON-ABSORPTION BAND ANALYSIS FOR THE DISCRIMINATION OF IRON-RICH ZONES.
Progress rept. 1 Jan-30 Jun 73,
Lawrence C. Rowan. 10 Jul 73, 26p NASA-CR-133817
Contract NASA Order S-70243-AG
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198. ERTS.

Descriptors: Nevada, Mineral exploration, Structural properties(Geology), Spectrum analysis, Iron ores, Earth resources program, Geological faults, Volcanology, Image enhancement,

The author has identified the following significant results. Study has concentrated on the two primary aspects of the project, structural analysis through evaluation of lineaments and circular features and spectral analyses through digital computer-processing techniques. Several previously unrecognized lineaments are mapped which may be the surface manifestations of major fault or fracture zones. Two of these, the Walker Lane and the Midas Trench lineament system, transect the predominantly NNE-NNW-trending mountain ranges for more than 500 km. Correlation of major lineaments with productive mining districts implies a genetic relationship, the 50 circular or elliptical features delineated suggest a related role for Tertiary volcanism. Color-ratio composites have been used to identify limonitic zones and to discriminate mafic and felsic rock by combining diazo color transparencies of three different ratios. EROS Data Center scene identification number for color composite in this report is ER 1 CC 500. Refinement of enhancement procedures for the ratio images is progressing. Fieldwork in coordination with both spectral and structural analyses is underway.

E73-11022/GA PC$3.00/MF$1.45
Wyoming Univ., Laramie. Dept. of Geology.
ANALYSIS OF ERTS-1 IMAGERY AND ITS APPLICATION TO EVALUATION OF WYOMING'S NATURAL RESOURCES.
Progress rept. Jul-Aug 73,
Ronald W. Marrs. 15 Sep 73, 10p ERTS-1-1-73D NASA-CR-133819
Contract NAS5-21799

Descriptors: Wyoming, Geology, Botany, Hydrology, Agriculture, Cultural resources, Earth resources program, Vegetation, Dunes, Forests, Structural properties(Geology), Resources management.

The author has identified the following significant results. A summary of the significant results of the studies completed during the July-August, 1973 period includes: (1) ERTS-1 image brightness contrasts can be related to important contrasts in rangeland and forest vegetation communities of the Laramie Basin. (2) Stereoscopic viewing is essential for correct structural interpretation in outcrop patterns in some areas. (3) Complex fracture patterns which may have exerted a controlling influence on intrusive activity in the Absaroka Mountains can be mapped from ERTS. (4) Volcanic lithologies of the Yellowstone region are often differentiated on the basis of their textures, and cannot be successfully mapped by photogeologic interpretation of ERTS-1 imagery. Ground spectral readings confirm a general lack of contrast between these lithologies in the four ERTS-1 MSS bands. (5) Major dune fields can be recognized and defined from ERTS-1 image interpretations and recognition of differences in stabilizing plant communities (some of which may be mappable from ERTS-1) yields information about migration history of the dune fields.

E73-11025/GA PC$3.00/MF$1.45
Geological Survey, Denver, Colo.
EVALUATION OF ERTS-1 IMAGERY FOR MAPPING QUATERNARY DEPOSITS AND LANDFORMS IN THE GREAT PLAINS AND MIDWEST.
Progress rept. 1 Jan-30 Jun 73,
Roger B. Morrison, and George R. Hallberg. 1 Jul 73, 10p NASA-CR-133822
Contract NASA Order S-70243-AG
Prepared in cooperation with the Iowa State Geological Survey, Iowa City.

Descriptors: Mapping, Land use, Land forms, Geology, Geomorphology, Great Plains Corridor(North America), Earth resources program, Soil science, Regional planning, Valleys, Rivers.

The author has identified the following significant results. Maps at 1:1 million scale exemplifying the first phase of investigation were prepared for ten study areas (mostly one deg x two deg in area): two in Kansas, one in Missouri-Kansas, two in Nebraska, one in South Dakota, three in Illinois, and one in Iowa-Illinois (a total of 13 such maps, covering about 97,000 sq. mi., since the start of the project). Collection of all pertinent published geologic-terrain data also has been completed for all the study areas for which these first-phase maps have been made. The ground truth data are being used in combination with additional interpretation of the repetitive ERTS-1 images of most of these study areas to prepare enhanced information maps at 1:500,000. For areas that have not been mapped at 1:500,000 or larger scales, the maps will provide the first moderately detailed information on landform features and surficial materials. Much of the information mapped is significant for exploration and development of ground water (and locally petroleum) and for applications in engineering and environmental geology, and land use patterns as indicated by tone and texture on the images. Numerous moraines have been identified; also, the trends of parts of ancient filled valleys have been identified. Valley alinement appears controlled by faults or other structural lineaments.

E73-11035/GA PC$3.00/MF$1.45
Geological Survey, Menlo Park, Calif.
IDENTIFICATION OF GEOSTRUCTURES OF CONTINENTAL CRUST, PARTICULARLY AS THEY RELATE TO MINERAL-RESOURCE EVALUATION.
Progress rept. 1 Jan-30 Jun 73,
George Gryc, and Ernest H. Lathram. 30 Jun 73, 10p NASA-CR-133881
Contract NASA Order S-70243-AG

Descriptors: Structural properties(Geology), Earth crust, Alaska, Mineral exploration, Earth resources program, Photomapping, Geological faults, Crude oil.

The author has identified the following significant results. Analysis of lineated lakes in the Umiat, Alaska area and comparison with know geology, gravity, and magnetic data in the area suggest concealed structures exist at depth, possibly at or near basement, which may represent targets for petroleum exploration. Compilation of reconnaissance geologic data on 1:250,000 scale enlargements of ERTS-1 images near Corwin reveal structural and stratigraphic anomalies that suggest the Cretaceous sequence is less thick than supposed and is repeated in a series of plates superimposed by flat thrust faults. The structural style differs from that in coeval strata to the northeast, across the northwest-trending linear zone separating differing tectonic styles in older strata noted earlier. The regional extension of a fault known locally in the McCarthy area has been recognized; this fault appears to form the boundary of a significant terrane of mid-Paleozoic metamorphic rocks. ERTS-1 images are being used operationally, at 1:1,000,000 scale in the compilation of regional geologic maps, and at 1:250,000 scale in field mapping in the Brooks Range, in the study of faults in seismically active southern Alaska, in field-checking interpretations previously made from ERTS-1 imagery, and orthophoto base maps for geologic maps.

FRNC-TH-335/GA PC$4.50/MF$1.45
Paris Univ., Orsay (France).
DETERMINATION OF VERY SMALL QUANTITIES OF RARE EARTHS IN TERRESTRIAL ROCK SAMPLES (B.C.R.1) AND LUNAR ROCK SAMPLES (APOLLO 14) USING MASS SPECTROMETRY.
G. Puil. 1972, 46p
In French. U.S. Sales Only.

Descriptors: (*Rocks, *Mass spectroscopy), (*Rare earths, Mass spectroscopy), (*Lunar materials, Mass spectroscopy), Accuracy, Apollo project, Calibration, Earth crust, Geochemistry, Isotope dilution, Mass spectrometers, Multi-element analysis, Quantitative chemical analysis, Sensitivity, Trace amounts.

For abstract, see NSA 28 02, number 02158.

INS-J-137/GA PC$4.00/MF$1.45
Tokyo Univ. (Japan). Inst. For Nuclear Study.
NICKEL: INDICATOR OF EXTRATERRESTRIAL MATTER ACCRETION ON THE EARTH.
H. Ohtsuka, Y. Tazawa, K. Yamakoshi, and S. Yasuda. 27 Nov 72, 9p
U.S. Sales Only.

Descriptors: (*Nickel, *Earth crust), Chemical composition, Meteorites.

For abstract, see NSA 28 02, number 05028.

ITJ-28/GA PC$3.75/MF$1.45
Institute of Nuclear Research, Krakow (Poland).
SOIL DENSITY MEASURING BY GAMMA -- GAMMA METHOD RANGE 0.5 TO 1.4 G/CM EXP 3 .
J. Moscicki. 1972, 33p
In Polish. U.S. Sales Only.

Descriptors: (*Soils, *Density), (*Densimeters, *Performance), Calibration, Cesium 137, Gamma radiation, Radiometric gages.

For abstract, see NSA 28 02, number 02747.

KFK-1728/GA PC$5.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Laboratorium fuer Isotopentechnik.
DETERMINATION OF TUNGSTEN IN ORES BY NONDISPERSIVE X-RAY FLUORESCENCE ANALYSIS.
A. Lubecki, and H. Vogg. Jan 73, 59p
In German. U.S. Sales Only.

Descriptors: (*Tungsten, *X-ray fluorescence analysis), (*Ores, X-ray fluorescence analysis), Cobalt 57, Compton effect, Geometry, Grain size, Measuring methods, Radiation sources, Spectra.

For abstract, see NSA 28 03, number 05191.

NVO-124/GA PC$3.50/MF$1.45
Nevada Operations Office (Aec), Las Vegas.
GEOLOGICAL INVESTIGATION OF THE BERING SEA FLOOR ADJACENT TO THE CANNIKIN DETONATION SITE ON AMCHITKA ISLAND, ALASKA.
T. M. Jr. Humphrey, and D. L. Branstetter. Feb 73, 30p

Descriptors: (*Amchitka island area, *Geology), Cannikin event, Seas, Seawater, Trees.

For abstract, see NSA 28 03, number 05587.

N73-27316/1GA PC$3.50/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
THE SIGNIFICANCE OF BIOLOGICAL FACTORS IN THE WEATHERING OF ROCKS AND MINERALS.
P. V. Ivashou. Jul 73, 29p NASA-TT-F-14892
Tran-Transl. Into English from the Publ. "Znacheniye Biologicheskikh Faktorov V Vyvetrivanii Porod I Mineralov" Moscow, Nauka, 1971 p 30-50.

Descriptors: *Biological effects, *Minerals, *Rocks, *Weathering, Animals, Carbon dioxide, Erosion, Microorganisms, Plant roots.

For abstract, see STAR 1118

N73-27339/3GA PC$5.00/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
INVESTIGATIONS OF EARTH DYNAMICS FROM SATELLITE OBSERVATIONS.
E. M. Gaposchkin. Mar 73, 59p NASA-CR-133414
Contract NGR-09-015-103

Descriptors: *Earth movements, *Satellite observation, *Tides, Data correlation, Ocean currents, Tectonics.

For abstract, see STAR 1118

N73-28448/1GA PC$17.00/MF$1.45
Colorado School of Mines, Golden. Dept. of Geology.
APPLICATION OF REMOTE SENSING TECHNIQUES TO THE GEOLOGY OF THE BONANZA VOLCANIC CENTER.
R. W. Marrs. Mar 73, 297p NASA-CR-133499, REPT-73-1
Contract NGL-06-001-015

Descriptors: *Remote sensors, *Volcanology, Aerial photography, Colorado, Geology, Mapping.

For abstract, see STAR 1119

PB-223 688/3GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
THE DISTINCTION BETWEEN CROCIDOLITE AND OTHER KINDS OF ASBESTOS,
L. M. Juckes. Aug 73, 6p BISRA-GS/EX/21/73/C

Descriptors: (*Asbestos, Identification systems), Petrography, Microscopy, Identifying, Tests, Great Britain, Toxicity, Industrial hygiene.

A test is described for distinguishing crocidolite from the less harmful varieties of asbestos using a petrological microscope. The test depends on the fact that crocidolite fibers are optically length-fast while other varieties are length-slow.

PB-223 786/5GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
EVALUATION OF METHODS FOR DETERMINING NAHCOLITE AND DAWSONITE IN OIL SHALES.
Rept. of investigations,
Charles W. Huggins, Thomas E. Green, and T. L. Turner. Aug 73, 26p BuMines-RI-7781
Prepared in cooperation with the Bureau of Mines, College Park, Md. College Park Metallurgy Research Center.

Descriptors: (*Oil shale, Chemical analysis), (*Carbonate minerals, Oil shale), Aluminates, X ray diffraction, Infrared spectroscopy, Differential thermal analysis, Pyrolysis, Minerals.
Identifiers: Nahcolite, Dawsonite.

X-ray diffraction, infrared spectroscopy, and thermal methods of analyses were evaluated for qualitative and quantitative determinations of minerals in oil shales. Errors caused by sample preparation and crystallinity are discussed. Quantitative determination of nahcolite and dawsonite were made by several methods and the results compared. (Author)

RLO-2227-T-9-10/GA PC$11.50/MF$1.45
Oregon State Univ., Corvallis.
GENESIS, MINERALOGY, AND PROPERTIES OF PARKDALE SOILS, OREGON.
B. L. Harris. Jun 73, 187p
Contract AT(45-1)-2227-T9

Descriptors: (*Soils, *Geochemistry), Chemical properties, Mineralogy, Physical properties, Quantitative chemical analysis.

For abstract, see NSA 28 03, number 07772.

RLO-2227-T-9-9/GA PC$8.75/MF$1.45
Oregon State Univ., Corvallis.
MINERALOGY AND TRACE ELEMENT CHEMISTRY OF MAZAMA ASH SOILS.
M. J. Dudas. Jun 73, 134p

Descriptors: (*Soils, *Chemistry), Clays, Mineralogy, Mountains, Petrology, Silicates, Trace amounts.

For abstract, see NSA 28 03, number 07771.

RME-4056/GA PC$3.00/MF$1.45
Division of Raw Materials (Aec), New York.
MINERALOGICAL AND GEOLOGICAL INVESTIGATIONS OF THE URANIUM DEPOSITS OF THE WIND RIVER DISTRICT, WYOMING.
R. G. Coleman. Jun 54, 18p

Descriptors: (*Uranium minerals, *Spatial distribution), Chemical state, Mineralogy, Quantitative chemical analysis, Radiometric analysis, Sandstones, Spectroscopy, Uranium ores, Wyoming.

For abstract, see NSA 28 02, number 02547.

TID-26306/GA PC$4.25/MF$1.45
Memphis State Univ., Tenn. (Usa).
URANIUM SERIES DATING OF STALAGMITES FROM BLANCHARD SPRINGS CAVERNS, STONE COUNTY, ARKANSAS.
G. M. Thompson. May 73, 42p

Descriptors: (*Calcium carbonates, *Isotope dating), (*Caves, Isotope dating), Arkansas, Equilibrium, Thorium, Uranium, Uranium 234, Uranium 238.

For abstract, see NSA 28 03, number 05576.

UCRL-13568/GA PC$11.25/MF$1.45
Blume (John a.) and Associates, Engineers, San Francisco, Calif.
INVESTIGATION OF FAULTING AT THE LAWRENCE LIVERMORE LABORATORY.
Dec 72, 185p

Descriptors: (*Lawrence livermore laboratory, *Geology), California, Nuclear power plants, Seismology, Site selection.

For abstract, see NSA 28 02, number 02613.

USGS-474-20/GA PC$3.25/MF$1.45
Geological Survey, Menlo Park, Calif.
SUBSURFACE TEMPERATURES FROM AMCHITKA ISLAND, ALASKA. AMCHITKA-16.
J. H. Sass, and T. H. Jr. Moses. May 69, 24p
Contract AT(29-2)-474

Descriptors: (*Amchitka island area, *Hydrology), Boreholes, Medium temperature, Temperature dependence, Underground.

For abstract, see NSA 28 02, number 02614.

8H. Hydrology and Limnology

AD-767 284/3GA PC$2.75/MF$1.45
Colorado State Univ Fort Collins Dept of Geology
AN EXPERIMENTAL STUDY OF DRAINAGE BASIN EVOLUTION AND THE INFLUENCE OF LANDFORMS ON HYDROLOGIC VARIABLES.
Final rept. 1 Jan 70-1 Sep 73,
Stanley A. Schumm, and Randolph S. Parker. 1 Sep 73, 20p Rept no. 4 AROD-8525:4-EN
Grant DA-ARO-D-31-124-70-G13

Descriptors: (*Drainage, Model tests), Erosion, Hydrology, Terrain.
Identifiers: Evolution(Development), Surface water runoff, Geomorphology, Landforms, Sediment transport, Watersheds.

A drainage evolution research facility was designed and constructed at Colorado State University during 1970. During two experimental seasons, (summer 1971, 1972) the evolutionary development of small drainage systems was documented by photography and mapping. The response of the drainage systems to baselevel change was recorded, and during the evolution of the systems, from inception of the drainage patterns, through maximum growth to eventual reduction of drainage density, hydrologic data were collected. These data have been related to the changing morphology of the evolving drainage system. (Author)

COO-3062-13/GA PC$5.45/MF$1.45
Johns Hopkins Univ., Baltimore, MD. Chesapeake Bay Inst.
BUOYANT SURFACE JET DISCHARGING NORMAL TO AN AMBIENT FLOW OF VARIOUS DEPTHS. TECHNICAL REPORT 81.
H. H. Carter, E. W. Schiemer, and R. Regier. Feb 73, 77p
Contract AT(11-1)-3062

Descriptors: (*Thermal effluents, *Flow models), (*Thermal pollution, Flow models), Jets.

For abstract, see NSA 28 03, number 05595.

E73-11007/GA PC$3.00/MF$1.45
Army Engineer Waterways Experiment Station, Vicksburg, Miss.
A TECHNIQUE FOR INTERPRETATION OF MULTISPECTRAL REMOTE SENSOR DATA,
A. N. Williamson. 19 Sep 73, 15p NASA-CR-133800
Presented at the Am. Soc. of Photogrammetry Symp. on Remote Sensing in Oceanography, Orlando, Fla., 2-5 Oct. 73.

Descriptors: Multispectral photography, Photointerpretation, Computer programming, Mississippi, Louisiana, Chesapeake Bay(US), Earth resources program, Reservoirs, Sediment transport, Spectral reflectance.

The author has identified the following significant results. The U.S. Army Engineer Waterways Experiment Station is engaged in a study to detect from ERTS-1 satellite data alterations to the absorption and scattering properties caused by movement of suspended particles and solutes in selected areas of the Chesapeake Bay and to correlate the data to determine the feasibility of delineating flow patterns, flushing action of the estuary, and sediment and pollutant dispersion. As a part of this study, ADP techniques have been developed that permit automatic interpretation of data from any multispectral remote sensor with computer systems which have limited memory capacity and computing speed. The multispectral

remote sensor is considered as a reflectance spectrophotometer. The data which define the spectral reflectance characteristics of a scene are scanned pixel by pixel. Each pixel whose spectral reflectance matches a reference spectrum is identified, and the results are shown in a map that identifies the locations where spectrum matches were detected and spectrum that was matched. The interpretation technique is described and an example of interpreted data from ERTS-1 is presented.

E73-11041/GA PC$3.00/MF$1.45
Army Coastal Engineering Research Center, Washington, D.C.
ESTUARY AND BARRIER ISLAND STUDY.
Progress rept. Jul-Aug 73,
Dennis W. Berg. Aug 73, 2p NASA-CR-133922
Contract NASA Order S-70260-AG

Descriptors: Estuaries, Islands, Barriers(Landforms), Earth resources program, Sediments, Coasts.

The author has identified the following significant results. Scan line distortion is apparent in ERTS-1 imagery, imparting a serrated-edge appearance to shorelines. This feature however does not hinder observation and interpretation of broad features such as shoaling areas and sediment plumes. Shoaling in the backshore areas and inlets is easily discernible in spectral bands 4 and 5. Contrast between land and water is especially striking in spectral band 7, allowing easy identification of tidal flat areas.

NVO-129/GA PC$4.75/MF$1.45
Nevada Operations Office (Aec), Las Vegas.
CLEANUP SUMMARY REPORT: TATUM DOME TEST SITE, MISSISSIPPI.
Apr 73, 53p

Descriptors: (*Sterling event, *Contamination), (*Surface waters, *Decontamination), (*Ground water, Decontamination), (*Soils, Decontamination), Contained explosions, Mississippi, Nuclear explosions, Radiation monitoring, Radioactive waste disposal, Salmon event, Underground explosions.

For abstract, see NSA 28 02, number 02611.

N73-27531/5GA PC$3.25/MF$1.45
Hosei Univ., Tokyo (Japan). Dept. of Geography.
SELECTED BIBLIOGRAPHY ON WATER BALANCE OF MONSOON ASIA (3).
T. Tsuchiya. 1973, 23p CLIMATOL-NOTES-11

Descriptors: *Asia, *Bibliographies, *Climatology, *Monsoons, India, Japan, Philippines, Rain, Southeast asia, Water management, Water resources.

For abstract, see STAR 1118

ORNL-TM-4119/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
STEADY TEMPERATURE DISTRIBUTIONS IN THE FAR-FIELD REGION OBTAINED BY SOLUTION OF THE EQUATION OF CONVECTIVE DIFFUSION IN TWO DIMENSIONS.
L. Dresner. Apr 73, 31p
Contract W-7405-eng-26

Descriptors: (*Thermal pollution, *Mathematical models), (*Heat transfer, Mathematical models), (*Waste heat, *Diffusion), Convection, F codes, Programming, S codes, Water.

For abstract, see NSA 28 02, number 02621.

ORNL-TM-4160/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
TRANSIENT COOLING OF A ONE-DIMENSIONAL THERMAL PLUME AND ITS APPLICATION FOR DETERMINING COLD SHOCK.
D. A. Pilati. May 73, 22p
Contract W-7405-eng-26

Descriptors: (*Plumes, *Heat transfer), (*Aquatic ecosystems, *Thermal pollution), Animals, Biological models, Biological shock, Computer calculations, Computer codes, Estuaries, F codes, Low temperature, Mathematical models, Plants, Rivers, Surface waters, Thermal diffusion, Time dependence, Variations, Waste heat.

For abstract, see NSA 28 02, number 02622.

PB-223 428/4GA PC$4.50/MF$1.45
Minnesota Univ., Minneapolis. Limnological Research Center.
ALGAL PHOTOSYNTHESIS, ALGAL ABUNDANCE, AND CHEMISTRY OF LAKE WATER AT FAIRMONT, MINNESOTA,
Arlo S. Knoll, and Robert O. Megard. Jul 73, 49p W73-14364, OWRR-A-026-MINN(1)

Descriptors: (*Algae, Nutrients), (*Lakes, Water chemistry), (*Water pollution, *Minnesota), Photosynthesis, Abundance, Seasonal variations, Phosphorus, Nitrogen, Chlorophylls, Ammonia.
Identifiers: *Eutrophication, Fairmont(Minnesota).

Concentrations of phosphorus, nitrate, ammonia, oxygen, chlorophyll a, and rates of algal photosynthesis in 5 lakes in Fairmont, Minnesota, were measured during spring, summer, and autumn, 1972. The relative abundance of the planktonic algae in the lakes was assessed by measuring the concentrations of chlorophyll a, one of the green pigments in algae and other plants. The average concentration for all five lakes, 57 mg/cum, is about twice the average concentration in Lake Minnetonka, near Minneapolis, and also about twice the highest concentrations in Lake Erie, the most polluted of the Great Lakes.

PB-223 503/4GA PC$2.75/MF$1.45
Florida Univ., Gainesville. Water Resources Research Center.
REMOTE SENSING OF WATER QUALITY: A STATE OF THE ART REPORT,
William J. Mitsch. May 73, 17p* WRRC-Pub-21
W73-14363, OWRR-A-999-FLA(5)
Contract DI-14-31-0001-3809

Descriptors: (*Water resources, *Remote sensing), Water quality, Water pollution, Environmental surveys, Aerial surveys, Spaceborne photography, Infrared detection.
Identifiers: Multiband spectral reconnaissance, ERTS satellites.

Remote sensing, or the carrying out of aerial or space surveys of the earth's surface, is finding several applications in the fields of water quality and water resource management. It offers a means of obtaining large amounts of data, but its value is in the expansion of data in the spatial, temporal and spectral modes. The most valuable techniques presently are photography, infrared scanning and multispectral scanning. Aircraft applications include the measuring of the distribution of various waste discharges into water bodies and the study of aquatic plant growth and benthic communities. The ERTS (Earth Resources Technology Satellite) program of the U.S. Department of the Interior is investigating satellite applications of monitoring the earth's resources. The water resource applications are less obvious than those of the aircraft and concern environmental indicators on a much larger scale. However, the satellite offers the enhancement of data in the temporal mode with periodic remote sensing of most of the earth's surface.

PB-223 557/0GA PC$4.50/MF$1.45
Texas Tech Univ., Lubbock. Water Resources Center.
MATHEMATICAL MANAGEMENT MODEL OF PARTS OF THE OGALLALA AQUIFER, TEXAS.
Final rept.,
Frank A. Rayner, Dan M. Wells, B. J. Claborn, D. D. Smith, and A. J. Sechrist. Jul 73, 141p W73-14359, OWRR-C-2101(3363)(2)
Contract DI-14-31-0001-3363
Prepared in cooperation with High Plains Underground Water Conservation District No. 1.

Descriptors: (*Ground water, Mathematical models), Aquifers, Water supply, Permeability, Digital simulation, Geology, Hydrogeology.
Identifiers: Ogallala aquifer, Parmer County(Texas), Ground water mining.

A digital computer procedure was developed for predicting to ultimate depletion a water table aquifer in which the configuration of the base of the aquifer becomes a controlling parameter. A portion of the 'Slaton Channel', a buried valley in the Ogallala Aquifer near Slaton, Texas, was selected for modeling. A parameter adjustment procedure was developed using the steepest descent optimization for minimizing errors in simulated water levels. This procedure treated permeability and storage coefficients, as well as net withdrawals, as variables for purposes of determining simulated water levels. The model developed in Phase I of the project was applied to Parmer County, Texas, after the completion of a very comprehensive investigation and report on groundwater conditions in August, 1971. The results of this application indicate that the model is applicable to any area for which accurate net withdrawal rates in the future can be established. (Modified author abstract)

PB-223 565/3GA PC-GPO/MF$1.45-NTIS
Environmental Protection Agency, Washington, D.C. Office of Research and Monitoring.
EFFECT OF SILT AND SILT REMOVAL IN A PRAIRIE LAKE.
Ecological Research series,
Clyde K. Brashier, Constance L. Churchill, and Gordon Leidahl. Jul 73, 209p W73-14373, EPA-R3-73-037
Prepared by South Dakota State Coll., Madison.
Paper copy available from GPO $2.60 as EP1.23:73-037.

Descriptors: (*Lake Madison, Limnology), (*Lake Herman, Limnology), (*Lakes, *Water pollution), South Dakota, Nutrients, Sewage, Effluents, Water chemistry, Sediments, Algae, Phytoplankton, Agricultural wastes, Soil erosion, Surface water runoff.
Identifiers: *Eutrophication.

A surveillance program has been maintained on two shallow, warm water prairie lakes and their tributaries. One of these lakes, Lake Madison, is domestically polluted with the effluent from the sewage treatment plant of Madison, South Dakota. The other, Lake Herman, is polluted due to siltation caused by run-off from a large, intensively farmed watershed. This surveillance program has resulted in comparisons of chemical nutrients and biota of a heavily silted lake with those of a relatively unsilted, but domestically polluted lake. The surveillance program on the Lake Herman tributaries has also led to conclusions regarding nutrient levels in successive spring run-offs. (Modified author abstract)

PB-223 576/0GA PC$3.50/MF$1.45
Bureau of Reclamation, Denver, Colo. Engineering and Research Center.
APPLICATION OF A MINICOMPUTER TO A CHANNEL CONTROL PROBLEM,
P. F. Enger, E. A. Strickland, M. Gutierrez, and V. B. Hartmen. Jul 73, 70p* REC-ERC-73-11

Descriptors: (*Channels(Waterways), Control equipment), (*Channel flow, Flow control), Automatic control, Digital computers, Programming manuals.
Identifiers: Minicomputers, SPC-12 computers.

A minicomputer was programmed to collect water surface information from three reaches of a model channel, and to adjust gates to maintain the water surfaces in the reaches, within a dead zone. The program treated the channel as a complete system using data on rates of change, water surface position, and history of the water surfaces. The system worked well when one demand was placed on the downstream section, or when other conditions, such as flood conditions, were established. Solid-state sensors developed to collect water surface data are described. Stepping motors were used to regulate the canal gates and were interfaced with the computer. Mathematical techniques used and test results are included. Suggested future uses of digital computers for channel control are discussed. Conclusions are that this line of investigation should be vigorously pursued.

PB-223 584/4GA PC-GPO/MF$1.45-NTIS
North Central Forest Experimental Station, St. Paul, Minn.
SEDIMENT IN A MICHIGAN TROUT STREAM--ITS SOURCE, MOVEMENT AND SOME EFFECTS ON FISH HABITAT.
Forest Service research paper (Final),
Edward A. Hansen. Nov 71, 20p FSRP-NC-59
Paper copy available from GPO $0.65 as A13.78:59.

Descriptors: (*Streams, Sediments), (*Trout, Streams), Suspended sediments, Bed load, Channel stabilization, Erosion, Michigan.

A sediment budget was constructed from 3-years of measurements on a pool and riffle stream. Total sediment load increased five times along a 26-mile length of stream; most sediment came from 204 eroding banks. Three-fourths of the total sediment load was sand size. The area of streambed covered with sand decreased downstream, indicating that the transporting capacity of the stream exceeded sediment supply. Complete streambank stabilization would reduce the sediment load by about half and probably result in streambed composition changes beneficial to trout.

PB-223 780/8GA PC$11.75/MF$1.45
Environmental Protection Agency, Denver, Colo. Region VIII.
YELLOWSTONE NATIONAL PARK. BASELINE WATER QUALITY SURVEY REPORT.
Rept. for May-Sep 70,
William J. Keffer, and Stephen L. Bugbee. 1972, 194p

Descriptors: (*National parks, *Environmental surveys), (*Water quality, National parks), Biological surveys, Water chemistry, Benthos, Limnology, Sewage treatment, Trace elements, Aquatic biology, Pesticides, Evaluation, Temperature, pH, Wyoming, Watersheds.
Identifiers: Baseline measurements, *Yellowstone National Park, Water quality data.

The report summarizes and evaluates water quality data obtained from the May 1970 to September 1970 investigation of the surface waters of Yellowstone National Park. A brief description of climatic conditions, streamflows and past water studies is presented along with recommendations for actions to preserve and enhance existing conditions. Special appendices present detailed discussions of mine drainage in Soda Butte Creek, sewage treatment facilities evaluations, pesticide and radiological results and a summary of ranges and means of chemical, and microbiological and biological data for park waters. (Author)

8I. Mining Engineering

AEMC/Chem.Engg-126/GA PC$4.50/MF$1.45
Atomic Energy Minerals Centre, Lahore (Pakistan).
BIBLIOGRAPHY ON THE EXTRACTION OF URANIUM FROM SEA WATER.
S. Khan, and M. Saleem. Jan 73, 47p
U.S. Sales Only.

Descriptors: (*Uranium, *Separation processes), (*Seawater, Uranium), Bibliographies.

For abstract, see NSA 28 02, number 02324.

CEA-N-1592/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
PRELIMINARY TESTS USING A FLUORINE WELL-LOGGING PROBE. REPORT OF THE REMIREMONT EXPEDITION, JUNE 26--30, 1972.
P. Dumesnil, and C. Andrieux. 20 Nov 72, 20p
In French. U.S. Sales Only.

Descriptors: (*Well logging, *Activation analysis), (*Fluorine, Activation analysis), Americium, Beryllium, Calcium fluorides, Measuring methods, Neutron beams, Neutron sources, Nitrogen 16, Performance testing, Sensitivity, Solid scintillation detectors.

For abstract, see NSA 28 02, number 02093.

CONF-730432-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
OPPORTUNITY COSTS OF LANDSCAPE MODIFICATION BY COAL SURFACE MINING.
R. L. Spore. 1972, 16p

Descriptors: (*Coal, *Mining), (*Regional analysis, *Economics), Cost, Environment, Human populations, Usa.

For abstract, see NSA 28 03, number 07614.

E73-11034/GA PC$3.00/MF$1.45
Geological Survey, Bloomington, Ind.
STUDY OF APPLICATION OF ERTS-A IMAGERY TO FRACTURE-RELATED MINE SAFETY HAZARDS IN THE COAL MINING INDUSTRY.
Significant Results rept.,
Charles Wier, Frank J. Wobber, Orville R. Russell, and Kenneth R. Martin. 28 Sep 73, 1p
NASA-CR-133866
Contract NAS5-21795
Prepared in cooperation with the Earth Satellite Corp., Washington, D.C.

Descriptors: Geological faults, Fracturing, Mines(Excavations), Safety, Coal, Ohio, Earth resources program, Reclamation, Vegetation.

The author has identified the following significant results. Mined land reclamation analysis procedures developed within the Indiana portion of the Illinois Coal Basin were independently tested in Ohio using 1:80,000 scale enlargements of ERTS-1 image 1029-15361-7 (dated August 21, 1972). An area in Belmont County was selected for analysis due to the extensive surface mining and the different degrees of reclamation occurring in this area. Contour minfng in this area provided the opportunity to extend techniques developed for analysis of relatively flat mining areas in Indiana to areas of rolling topography in Ohio. The analysts had no previous experience in the area. Field investigations largely confirmed office analysis results although in a few areas estimates of vegetation percentages were found to be too high. In one area this error approximated 25%. These results suggest that systematic ERTS-1 analysis in combination with selective field sampling can provide reliable vegetation percentage estimates in excess of 25% accuracy with minimum equipment investment and training. The utility of ERTS-1 for practical and resonably reliable update of mined lands information for groups with budget limitations is suggested. Many states can benefit from low cost updates using ERTS-1 imagery from public sources.

LA-UR-73-459/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
SUBTERRENE INSTRUMENTATION REQUIREMENTS.
J. W. Jr. Neudecker. 1973, 6p CONF-730510-1
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Control equipment), Accelerometers, Boreholes, Melting, Monitoring, Rock drilling, Rocks, Soils, Specifications.

For abstract, see NSA 28 03, number 05461.

LA-5204-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
SUBTERRENE PENETRATION RATE: MELTING POWER RELATIONSHIP.
R. G. Gido. Mar 73, 12p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Performance), Boreholes, Efficiency, Excavation, Melting, Operation, Performance testing, Rock drilling, Rocks, Soils, Thermal diffusion, Tunnels.

For abstract, see NSA 28 03, number 05455.

LA-5205-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DESIGN AND DEVELOPMENT OF PROTOTYPE UNIVERSAL EXTRUDING SUBTERRENE PENETRATORS.
J. W. Neudecker, A. J. Giger, and P. E. Armstrong. Mar 73, 19p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Design), Boreholes, Extrusion, Materials handling, Melting, Rock drilling, Rocks, Soils.

For abstract, see NSA 28 03, number 05456.

LA-5206-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
IDENTIFICATION OF POTENTIAL APPLICATIONS FOR ROCK-MELTING SUBTERRENES.
D. L. Sims. Feb 73, 17p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Uses), Boreholes, Excavation, Melting, Rock drilling, Rocks, Soils, Tunnels.

For abstract, see NSA 28 03, number 05457.

LA-5209-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DEVELOPMENT AND CONSTRUCTION OF A MODULARIZED MOBILE ROCK-MELTING SUBTERRENE DEMONSTRATION UNIT.
R. E. Williams. Mar 73, 10p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Fabrication), Boreholes, Design, Melting, Operation, Performance testing, Rock drilling, Rocks, Soils.

For abstract, see NSA 28 03, number 05458.

LA-5212-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DESIGN DESCRIPTION OF MELTING-CONSOLIDATING PROTOTYPE SUBTERRENE PENETRATORS.
J. W. Neudecker. Feb 73, 18p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Design), Boreholes, Melting, Operation, Performance testing, Rock drilling, Rocks, Soils.

For abstract, see NSA 28 03, number 05459.

LA-5213-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DESCRIPTION OF FIELD TESTS FOR ROCK-MELTING PENETRATION.
R. G. Gido. Feb 73, 14p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Performance testing), Boreholes, Design, Melting, Operation, Rock drilling, Rocks, Soils.

For abstract, see NSA 28 03, number 05460.

LBL-1391/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
SHATTERING ROCK WITH INTENSE BURSTS OF ENERGETIC ELECTRONS.
R. T. Avery, D. Keefe, T. L. Brekke, and I. Finnie. Mar 73, 6p CONF-730310-28
Contract W-7405-eng-48

Descriptors: (*Rocks, *Excavation), (*Electron beams, *Rock drilling), (*Accelerators, Electron beams), Pulses, Uses.

For abstract, see NSA 28 03, number 05462.

NVO-38-29(Suppl.1)/GA PC$5.45/MF$1.45
Fenix and Scisson, Inc., Las Vegas, Nev.
VERTICAL HOLE DEVELOPMENT STUDY. SUPPLEMENT NO. 1.
W. W. Grovenburg, and J. A. Walker. Apr 73, 48p
Contract AT(26-1)-38

Descriptors: (*Boreholes, *Construction), Efficiency, Fabrication, Rock drilling.

For abstract, see NSA 28 02, number 02499.

PAT-APPL-393 385/GA PC$3.00/MF$1.45
Department of the Interior, Washington, D.C.
RECOVERY OF SULFUR.
Patent Application,
Richard D. Baker. Filed 31 Aug 73, 3p
DOCKET/MIN-2165
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Patent applications, Materials recovery), (*Materials recovery, Sulfur), (*Industrial waste treatment, Sulfur), Ammonium compounds, Inorganic sulfides, Decomposition, Leaching, Pyrolysis, Residues, Hydrometallurgy.
Identifiers: PAT-CL-23-224, Ammonium sulfides.

The patent application describes sulfur recovery from leach residues by extraction with ammonium sulfide solution, followed by thermal decomposition of the pregnant solution to yield elemental sulfur.

PB-223 597/6GA PC$3.75/MF$1.45
Hauser Labs., Boulder, Colo.
AIR-INFLATABLE TEMPORARY SUPPORTS FOR COAL MINE ROOFS.
Final rept. 26 May 71-26 May 73.
12 Jun 73, 81p* BuMines-OFR-56-73
Contract H0210058

Descriptors: (*Supports, Inflatable structures), (*Underground supporting, Coal mines), Roofs, Coal mining, Room and pillar mining, Tunneling(Excavation), Beams(Supports), Coated fabrics.

The report covers development of a temporary support system for coal mine roofs involving the use of overhead rigid spanners supported by pneumatically operated telescoping columns. Test data for individual components as well as for the entire system are reported. Data reported show that the system supports 80-100 pounds of thrust against the mine roof per pound of support as contrasted to a system of conventional mine jacks that support 50 pounds thrust per pound of jack. As individual components, two of the pneumatically actuated telebeams supported a spanner load of 3 psi over an area 2 by 18 inches. (Author)

PB-223 742/8GA PC$4.25/MF$1.45
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
PLASTIC LINERS EXTENDED WITH SAND AND OTHER FILLERS FOR USE IN COAL MINES.
Final rept. 18 Jun 71-1 Jun 72,
J. L. Schwendeman, S. M. Sun, and I. O. Salyer. Oct 72, 123p* BuMines-OFR-60-73
Contract H0210060

Descriptors: (*Liners, *Filled composites), (*Coal mines, Liners), Epoxy resins, Polyester resins, Phenolic resins, Fillers, Supports, Underground supporting, Roofs, Feasibility, Sands, Mining engineering.

The research was to show the feasibility of using plastic liners containing sand and other fillers as a means of roof support in coal and other mines. Phase I, directed toward determining which state-of-the-art resin systems might have utility as a means of roof support in a coal mine, consisted of a canvass of resin manufacturers to learn which resins were available commercially that might have utility for this application. The resins submitted by the manufacturers were evaluated in a number of simple tests to define which of them would be most suitable for roof support use. Phase II included experimental work directed toward better defining the utility of selected resins and, finally, extensive evaluation of two resins for usefulness as components of a mine support system. During Phase I a number of fillers (fibrous and particulate) were evaluated. In Phase II all work was done using concrete sand as the major filler along with a minor amount of chopped glass roving as a fibrous filler.

PB-223 775/8GA PC$3.50/MF$1.45
Earth Sciences Research, Inc., Cambridge, Mass.
DEVELOPMENT OF MULTIPLEXED BOREHOLE INCLINOMETER PROBE, DATA ACQUISITION AND CALCULATION SYSTEM.
Final rept. Aug 71-Jun 73.
24 Aug 73, 27p BuMines-OFR-57-73
Contract H0220001

Descriptors: (*Inclinometers, Boreholes), Mining engineering, Displacement, Data processing equipment, Performance evaluation.

The purpose of the work was to develop a borehole inclinometer for use in steeply inclined and horizontal boreholes in order to measure lateral displacements of ground. The objective was not achieved. Positive results of the work included a computer and on-line data acquisition and calculation program. The work did not result in any significant improvement in mining technology.

PB-223 778/2GA PC-GPO/MF$1.45-NTIS
Pennsylvania State Univ., University Park. Dept. of Mineral Engineering.
AN ANALYSIS OF STRIP MINING METHODS AND EQUIPMENT SELECTION.
Interim rept. no. 7,
Robert Stefanko, R. V. Ramani, and Michael R. Ferko. 29 May 73, 148p OCR-RDR-61
Contract DI-14-01-0001-390
Paper copy available from GOP $1.55 as no. I63.10:61/INT-7.

Descriptors: (*Strip Mining, Analyzing), Mining equipment, Excavating equipment, Coal mining, Trends.

Over the years strip mining has been progressively expanding its production of domestic coal. Although this is true, numerous bills are now pending in Congress that would ban it completely or, at a minimum, place very severe restrictions upon it. However, a substantial portion of the United States coal resources occur in thick seams under shallow overburden for which strip mining is practically the only alternative. On the assumption that strip mining will retain an important position and probably will grow in the future, it is important to develop effective mining techniques that will permit strip mining with minimum ecological damage. The report gathers in one place an exhaustive study of all present day representative strip mining techniques, emphasizing the need to match equipment to natural conditions and vice versa. Furthermore, it reveals successful reclamation efforts by various companies and indicates what might be possible in the future.

PB-223 877/2GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
MINIMUM EXTINGUISHANT AND MAXIMUM OXYGEN CONCENTRATIONS FOR EXTINGUISHING COAL DUST-AIR EXPLOSIONS.
Rept. of Investigations,
Joseph Grumer, Leon F. Miller, Arthur E. Bruszak, and Louis E. Dalverny. Aug 73, 11p
BuMines-RI-7782
Prepared in cooperation with Pittsburgh Mining and Safety Research Center, Pa.

Descriptors: (*Dust explosions, *Fire extinguishing agents), (*Coal dust, Fire extinguishing agents), Calcium sulfates, Ammonium compounds, Sodium phosphates, Sodium compounds, Aluminates, Fluorides, Calcium phosphates, Mine fires.
Identifiers: Sodium fluoroaluminate.

Ten powders have been evaluated for their relative efficacy in extinguishing propagating coal dust-air explosions. These are anhydrite (calcium sulphate), mono-basic ammonium phosphate of which four preparations were examined, dibasic ammonium phosphate, natural and synthetic cryolite (sodium fluoaluminate), sodium sulfate and tricalcium phosphate. The ammonium phosphates were superior to the other powders. The maximum oxygen concentration for the extinguishment of otherwise uninhibited coal dust explosions and the influence of coal dust particle size and the volatile content of the coal were also explored. For the present, the choice of the inhibitor among the good ones evaluated is not as critical as the system to be used to deploy the extinguishant against a coal dust explosion.

TID-26294/GA PC$4.00/MF$1.45
Grand Junction Office (Aec), Colo. Ore Reserves and Production Div.
EXAMPLES OF OVERALL ECONOMICS IN A FUTURE CYCLE OF URANIUM CONCENTRATE PRODUCTION FOR ASSUMED OPEN PIT AND UNDERGROUND MINING OPERATIONS.
J. Klemenic. 20 Oct 72, 36p

Descriptors: (*Uranium ores, *Mining), Economics, Uranium concentrates.

For abstract, see NSA 28 03, number 05517.

TID-26319/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
BROWN COAL SURFACE MINING AND LAND RESTORATION IN GERMANY: AN EXAMPLE OF ENLIGHTENED LAND STEWARDSHIP.
E. A. Nephew. 1972, 14p

Descriptors: (*Coal, *Mining), (*German federal republic, Mining), Cost, Economics, Energy sources, Environment, Land pollution, Legal aspects, Lignite.

For abstract, see NSA 28 02, number 04952.

8J. Physical Oceanography

AD-767 043/3GA PC$4.75/MF$1.45
Washington Univ Seattle Applied Physics Lab
STUDIES IN THE MARGINAL ICE ZONE OF THE CHUKCHI SEA. ACOUSTIC AND OCEANOGRAPHIC DATA FOR 1972,
Gerald R. Garrison, Elbert A. Pence, and Henry R. Feldman. 31 Jul 73, 157p Rept no. APL-UW-7309
Contract N000123-71-C-1333, ARPA Order-1782

Descriptors: (*Oceanographic data, *Chukchi Sea), Sea ice, Temperature, Salinity, Ocean currents, Underwater sound, Sound transmission, Arctic Regions, Ice islands.
Identifiers: Graphs(Charts), Tables(Data).

Oceanographic and acoustic measurements were made from an icebreaker and from a camp on an ice floe in the Chukchi Sea during the summer of 1972. The purpose of this report is to present the large amount of data in a form which involves only a minimum amount of processing. These data include temperature and salinity profiles, current measurements, sound level profiles at short range from a 60-kHz pulse transmitter, volume reverberation from biological scatterers, and ice floe movement in relation to wind and currents. The analysis of these data will appear in a subsequent report. (Author)

AD-767 121/7GA Reprint
Woods Hole Oceanographic Institution Mass
A GIANT PISTON-CORER.
Technical rept.,
Charles D. Hollister, Armand J. Silva, and Alan Driscoll. Aug 73, 16p Rept nos. WHOI-73-52, WHOI-Contrib-2945
Contracts N00014-66-C-0241, N00014-72-A-0372-0001
Availability: Pub. in the Ocean Engineering, v2 p159-168 1973.

Descriptors: (*Ocean bottom sampling, *Oceanographic equipment), Maine Gulf, Soils, Grain size, Moisture, Density, Shear stresses.
Identifiers: Piston coring, Drill core analysis.

A new large piston-coring device using well-casing pipe 14 cm (o.d.), 11 cm (i.d.) has obtained cores over 20 m in length in water depths of 100 to 5000 m. Recovery ratios range from 0.76 to 0.87. Penetration varies between 24 and 29 m with a total core weight of 3200-4000 kg and 3 to 3 m of free fall. (Author)

AD-767 140/7GA Reprint
Rhode Island Univ Kingston Graduate School of Oceanography
SMALL-SCALE OXYGEN VARIATIONS IN THE THERMOCLINE,
Dana R. Kester, Kimball T. Crocker, and Gerard R. Miller, Jr. 4 Dec 72, 8p Rept no. Ref-73-7
Contract N00014-68-A-0215-0003
Revision of report dated 18 Aug 72.
Availability: Pub. in the Deep-Sea Research, v20 p409-412 1973.

Descriptors: (*Sea water, Oxygen), Atlantic Ocean, Thermoclines, Salinity, Temperature, Depth finding, Sensors.
Identifiers: *Dissolved gases.

An in situ sensor was used in conjunction with an STD to map the oxygen distribution in the thermocline of a 40 km region of the mid-Atlantic Ocean. The oxygen distribution was resolved to better than 0.07 ml/l and spatially to better than 10 m vertically and 2 km horizontally. An oxygen minimum was observed at 350 m which contained 0.4 ml/l less oxygen than its surroundings. This study demonstrates the small-scale variability which can exist in the oceanic oxygen distribution, and it illustrates the value of continuous in situ oxygen measurements in examining advective and mixing processes. (Author)

AD-767 161/3GA Reprint
Texas A and M Univ College Station Dept of Oceanography
OCEAN MICROSTRUCTURE DUE TO INSTABILITY FOR DIFFERENT HEAT-SALT DIFFUSIVITY,
Takashi Ichiye. 1973, 12p
Contract N00014-68-A-0308-0002, Grant NSF-GA-26498
Availability: Pub. in Memoires Societe Royale des Science de Liege, ser6 v4 p69-80 1973.

Descriptors: (*Thermoclines, Salinity), Ocean waves, Equations of motion, Mexico Gulf.
Identifiers: Internal waves.

Low salinity layers (LSL) 10 m or less thick were observed in the thermocline of the continental slope off Texas. Salinity decrement with depth reaches 0.1 ppt per m but corresponding temperature decrement keeps these layers statically stable. Breaking of internal waves is considered a cause of LSL. If temperature and salinity have different diffusivities, the frequency equation for internal waves has a root which makes amplitudes grow exponentially with time. The amplification becomes maximal for aspect ratios (vertical against horizontal dimension) of 0.01 with temperature and salinity field similar to the slope off Texas but for the Sargasso Sea the aspect ratios of the order of 0.1 may cause maximal instability. However, the vertical eddy viscosity always dissipates the internal waves, yielding the damping coefficient as a product with the square of the vertical wave number. (Author)

AD-767 391/6GA PC$3.50/MF$1.45
Sparcom Inc Alexandria Va
PRELIMINARY DESIGN CRITERIA, PERFORMANCE AND LIMITATIONS OF AN AIRBORNE LASER BATHYMETRIC SYSTEM.
Technical rept.,
G. D. Hickman, and A. H. Ghovanlou. Aug 73, 56p Rept no. TR-3
Contract N00014-71-C-0202

Descriptors: (*Ocean bottom, Depth finding), (*Oceanographic equipment, Airborne), Gas lasers, Light transmission, Air-to-underwater, Underwater light, Scattering, Performance(Engineering).
Identifiers: *Bathymetry, Remote sensing, Neon lasers, Suspended sediments.

Many of the salient parameters have been determined which define the capability and system requirements for an airborne laser/receiver bathymetric system operating in turbid waters. Laboratory transmission/scattering measurements which had been made of a pulsed blue-green neon laser through waters of varying turbidity were used to develop an empirical model for predicting the performance of an airborne laser bathymetric system. The maximum depth measuring capability (alpha h) sub max) was determined to be approximately 15 attenuation lengths for a laser system operating at 30 kw/peak pulse from an altitude of 500 meters. The optimum scan angle of the laser transmitter was determined to be approximately 20 degrees while the scan rate for a laser pulsing at 100 pps was 0.8 seconds. Airborne and pier measurements are currently being conducted to test the validity of this empirical model. (Modified author abstract)

AD-767 474/0GA PC$23.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
OPTICS OF THE SEA (INTERFACE AND IN-WATER TRANSMISSION AND IMAGING).
Lecture series,
P. Halley, and H. Hodara. Aug 73, 431p Rept no. AGARD-LS-61
NATO furnished.

Descriptors: (*Underwater light, Light transmission), (*Light transmission, Air-to-underwater), Refraction, Reflection, Polarization, Surface roughness, Solar radiation, Thermoclines, Sea water, Salinity, Attenuation, Scattering, Optical images, Ocean surveillance, Underwater object locators, Underwater communication systems, Symposia.
Identifiers: Remote sensing, Sea states, Suspended sediments, Light scattering, Ocean surface.

Contents: Reflection and refraction of light at the sea surface: theory and experiment, Radiance distribution below the sea surface, Apercu sur les theories du transfert radiatif applicables a la propagation dans la mer, Energie solaire et thermocline saisonniere, Facteurs physiques chimiques et biologiques affectant la propagation de la lumiere dans les eaux de mer, Refractive index fluctuations in sea water, Variation of optical sea parameters with depth, Diffusion de la lumiere par les eaux de mer. resultats experimentaux et approche theorique, Theory of small angle scattering, Experimental results of small scattering, Factors affecting long range vision, Criteria for vision: resolution, signal-to-noise ratio and contrast, Medium and system transform functions, Sources: arc, flash, incandescent and laser lamps, Receivers: photoelectronic and photographic detectors, Underwater lenses and optical ports, Long range vision techniques, Spatial filtering and image restoration, FORTRAN algorithms for underwater optics.

AD-767 541/6GA PC$3.50/MF$1.45
Coast Guard Washington D C Oceanographic Unit
TAUT-LINE INSTRUMENTED ARRAYS USED BY THE COAST GUARD OCEANOGRAPHIC UNIT DURING 1970-1971.
Technical rept.,
Christopher L. Vais, Alan D. Rosebrook, Thomas C. Wolford, and Robert Erwin Ettle. Oct 72, 26p Rept no. USCG-TR-72-1

Descriptors: (*Oceanographic equipment, Mooring buoys), (*Ocean currents, Atlantic Ocean), Moorings, Loading(Mechanics), Tensile properties.

The Coast Guard Oceanographic Unit (CGOU) used taut-line instrumented arrays to investigate the current regime near the Grand Banks of Newfoundland. The instrumented arrays used were patterned after a design developed and used by Woods Hole Oceanographic Institution. G. B. Shick's Circular Arc Approximation was used to compute the tension in the mooring line. The arrays were set and recovered by Coast Guard personnel under the supervision of CGOU field parties. (Author)

AD-767 635/6GA PC$3.00/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
IN-SITU STRENGTH OF SEAFLOOR SOIL DETERMINED FROM TESTS ON PARTIALLY DISTURBED CORES.
Technical note, Jan 71-May 72,
H. J. Lee. Aug 73, 35p Rept no. NCEL-TN-1295

Descriptors: (*Ocean bottom, *Soil mechanics), Ocean bottom sampling, Sedimentation, Penetration, Sampling, Shear stresses, Vibration, Storage.
Identifiers: Pore pressure, In situ tests.

The major obstacle to rational design of seafloor foundations and anchors has been a lack of good quality information on the bottom sediment engineering properties. Considerable engineering property data have been obtained through laboratory testing of core samples, but most of these data are of questionable validity because of sample disturbance factor. To improve the usability and credibility of laboratory test data, an experimental investigation was undertaken to determine the extent of disturbance involved in seafloor soil sampling and handling. In-situ tests were performed and related to comparable laboratory tests. The soils tested were from the Santa Barbara Channel with a terrigenous (land derived) origin. A

technique based on earlier work was developed for predicting indsitu shear strength on the basis of laboratory test results. Various disturbance mechanisms including sampling, vibration, long-term nonrefrigerated storage, and water and air expansion were investigated and analyzed quantitatively. Strength reductions varying between 15 and 50 percent were observed to result from these disturbances. The in-situ strength prediction procedure appears to be capable of compensating for all forms of disturbance except for those developing as a result of gas expansion. (Author)

COM-73-11494/4GA Reprint
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
SHELF SEDIMENT TRANSPORT: A PROBABILITY MODEL,
Donald J. P. Swift, John C. Ludwick, and W. Richard Boehmer. 1972, 30p NOAA-73080941
Pub. in Shelf Sediment Transport, chpt 9 p195-223 1972.

Descriptors: (*Continental shelves, *Sediment transport), Topographic features, Mathematical models, MARKOV processes, Probability Theory, Particle size distribution, Texture, Kurtosis, Sands.

The Markov process model for simulation of a one-dimensional sediment-transport model provided some fundamental insights into the generation and evolution of sediment size frequency distributions. Rectangular input distributions evolve toward more centralized distributions. Progressive size sorting of normal size distributions will occur as long as the transport surface will accept grains for permanent deposition. If sediment mobility decreases exponentially with increasing size, there will be a concomitant down-current decrease in standard deviation and increase in kurtosis. If competence decreases with distance through the system, skewness will become markedly positive. While a one-dimensional Markoy model is useful for analyzing the textural or compositional evolution of sediment, two-dimensional models should permit evaluation of depositional topography, and the hydraulic mechanisms that produce shelf sand bodies.

COM-73-11496/9GA Reprint
National Oceanic and Atmospheric Administration, Miami, Fla. Sea-Air Interaction Lab.
ATTENUANCE OF BROAD-BAND SOLAR IRRADIANCE IN THE OCEAN,
Kirby J. Hanson, and Monte F. Poindexter. 1972, 5p NOAA-73080938
Pub. in Proceedings of Conference on Atmospheric Radiation, Fort Collins, Colo., 7-9 Aug 72 p165-168.

Descriptors: (*Heat budget, Sargasso Sea), Irradiance, Air water interactions.
Identifiers: Ocean surface, International Decade of Ocean Exploration.

The author presents solar irradiance profiles obtained along the southwestern side of the Sargasso Sea during the International Decade of Ocean Exploration mixed layer experiment in Sept-October, 1971. The purpose of the experiment was to measure directly the diurnal heat budget of the mixed layer of the ocean and to compare the change in heat storage with the energy gains and losses to the ocean.

E73-11031/GA PC$3.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
APPLICATION OF ERTS-1 DATA TO THE PROTECTION AND MANAGEMENT OF NEW JERSEY'S COASTAL ENVIRONMENT.
Progress rept.,
Roland S. Yunghans, Edward B. Feinberg, Frank J. Wobber, Robert L. Mairs, and Robert T. Macomber. 12 Sep 73, 12p NASA-CR-133864
Contract NAS5-21765
Prepared in cooperation with the New Jersey Dept. of Environmental Protection, Trenton.

Descriptors: New Jersey, Coastal water, Coastal plains, Earth resources program, Erosion, Coastal currents, Resources management.

The author has identified the following significant results. Rates of erosion and accretion of the shoreline are being calculated for two test areas along the New Jersey coast. Measurements are made on aerial photographs taken over the last 20 years and processed by computer. The rates are presented in graphic form on an ERTS-1 base map at a scale of 1:125,000. These rates are being used to determine the effectiveness of various shore protection structures at preventing sand removal and encouraging sand accumulation. Information on maintenance and construction expenditures is being used to obtain a cost effectiveness ratio for various shore protection devices. The relationship of erosion rates, property value, and project cost are all criteria for selection of site type and extent of a shore protection structure. Compilation and evaluation of historical data will identify past decision making patterns. The effectiveness of these decisions with respect to erosion rates, property value, and project cost, can be used as an added criteria for future allocation of money and the selection of site and type of structure to be built.

NP-19706/GA PC$4.25/MF$1.45
Studiengesellschaft Zur Foerderung der Kernenergieverwertung in Schiffbau und Schiffahrt E. V., Hamburg (West Germany).
OVERLOADING THE SEA WITH WASTE PRODUCTS.
H. Walden. 1972, 41p
In German. U.S. Sales Only.

Descriptors: (*Seas, *Radioactivity), Atomic energy agreements, Fallout, Fuel reprocessing plants, International agreements, Marine disposal, Mines, Nonradioactive waste disposal, Nuclear power plants, Nuclear ships, Oceanography, Radiation protection, Radioactive waste disposal, Seawater, Uranium, Water pollution.

For abstract, see NSA 28 03, number 05529.

N73-27317/9GA PC$3.25/MF$1.45
Techtran Corp., Glen Burnie, Md.
RESULTS OF REMOTE SOUNDING OF THE ATMOSPHERE AND OCEAN IN THE INFRARED AND MICROWAVE REGIONS ON THE 13TH VOYAGE OF THE SCIENTIFIC RESEARCH VESSEL "ACADEMICIAN KURCHATOV".
A. K. Gorodetskiy, D. T. Matveyev, and A. P. Orlov. Jul 73, 22p NASA-TT-F-14972
Contract NASW-2485
Tran-Transl. Into English of "Rezultaty Distantsionnogo Zondirovaniya Atmosfery I Okeana V Infrakrasnom I Mikrovolnovom Diapazonakh V XIII Reyse Nis "Akademik Kurchatov", Acad. Of Sci., Inst. Of Space Res., Moscow, Report Presented at Meeting of the Sov.-AM. Working Group on Remote Sensing of Natural Environment from Space, 12-17 Feb. 1973 47 p.

Descriptors: *Remote sensors, *Thermal radiation, Atlantic ocean, Atmospheric radiation, Foams, Infrared spectra, Microwaves, Surface properties.

For abstract, see STAR 1118

N73-27333/6GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DYNAMICS AND MORPHOLOGY OF BEAUFORT SEA ICE DETERMINED FROM SATELLITES, AIRCRAFT, AND DRIFTING STATIONS.
W. J. Campbell, P. Gloersen, W. Nordberg, and T. T. Wilheit. Jun 73, 33p NASA-TM-X-66291, X-650-73-194
Subm-Submitted for Publication.

Descriptors: *Aerial reconnaissance, *Beaufort sea (North america), *Satellite observation, *Sea ice, Earth resources technology satellite a, Nimbus 4 satellite, Nimbus 5 satellite.

For abstract, see STAR 1118

PB-223 395/5GA PC$3.00/MF$1.45
Geological Survey, Menlo Park, Calif.
THERMAL GRADIENT MEASUREMENTS IN SEDIMENTS IN THE ATLANTIS II DEEP BRINE POOL OF THE RED SEA (1971).
Final rept.,
Robert O. Fournier. Aug 73, 15p USGS-GD-73-033

Descriptors: (*Sediments, *Red Sea), Sea water brine, Bottom water, Heat flux.

Six thermal gradient measurements in sediments beneath Atlantis II Deep brine pool were made using maximum registering glass thermometers as part of routine gravity and poston coring operations. The measured gradients ranged from 0 to 0.88C/m with most in the range 0.1 to 0.3C/m. Relatively thin sediment cover basalt and a temperature of only about 69.7C near the basalt-sediment interface at one station make uniform heating from below, either by conduction or convection, unattractive as a mechanism of heating the brine pool. It is proposed that hot brine (104 to 113C) identical in salinity with the lower of two density-stratified brine-pool units, discharges from localized vents along fracture zones. Initially, the entering hot brine has a lower density than the 59.2C brine; it moves up through that brine and spreads out along the interface between the upper and lower brine units. The resulting lateral movement of fluid along this interface causes widespread convective overturn in both brine units. The lower unit is heated by direct mixing with the entering brine, whereas the upper unit is heated mainly by diffusion.

RLO-2225-T-20-9/GA PC$3.50/MF$1.45
Washington Univ., Seattle. Dept. Of Chemistry.
RADIOCARBON IN THE SEA. PROGRESS REPORT, MAY 1, 1972--MAY 1, 1973.
A. W. Fairhall. 1973, 30p
Contract AT(45-10)-2225

Descriptors: (*Carbon 14, *Diffusion), (*Pacific ocean, *Radionuclide migration), Carbon, Carbon dioxide, Deposition, Depth, Earth atmosphere, Fallout, Mathematical models, Quantity ratio, Seawater, Time dependence, Variations.

For abstract, see NSA 28 03, number 05562.

RLO-2229-T-1-19/GA PC$3.00/MF$1.45
Alaska Univ., College. Inst. Of Marine Science.
WORK IN PROGRESS (TRACE METAL ASSOCIATIONS IN SUBARCTIC FJORD ENVIRONMENTS).
D. C. Burrell. 7p
Contract AT(45-1)-2229

Descriptors: (*Metals, *Chemical analysis), (*Seawater, Chemical analysis), (*Sediments, Chemical analysis), Absorption spectroscopy, Alaska, Coastal waters, Quantitative chemical analysis, Trace amounts.

For abstract, see NSA 28 03, number 07773.

8K. Seismology

CGS-C-119/GA PC$7.50/MF$1.45
Coast and Geodetic Survey, Las Vegas, Nev. Special Projects Party.
PRELIMINARY CALIBRATION OF THE SCATT-1 SYSTEM.
16 Feb 68, 106p

Descriptors: (*Seismology, *Electronic equipment), Amplifiers, Calibration, Recording systems, Transducers.

For abstract, see NSA 28 02, number 05012.

CGS-746-106/GA PC$4.50/MF$1.45
National Ocean Survey, Rockville, MD.
ALEUTIAN SEISMIC PROGRAM. SEISMOLOGICAL BULLETIN, APRIL 1970.
Feb 71, 49p
Contract AT(29-2)-746

Descriptors: (*Aleutian islands, *Seismology).

For abstract, see NSA 28 02, number 05009.

CGS-746-107/GA PC$6.25/MF$1.45
National Ocean Survey, Rockville, MD.
ALEUTIAN SEISMIC PROGRAM. SEISMOLOGICAL BULLETIN, MAY 1970.
Feb 71, 81p
Contract AT(29-2)-746

Descriptors: (*Aleutian islands, *Seismology).

For abstract, see NSA 28 02, number 05010.

CGS-746-108/GA PC$6.00/MF$1.45
National Ocean Survey, Rockville, MD.
ALEUTIAN SEISMIC PROGRAM. SEISMOLOGICAL BULLETIN, JUNE 1970.
Feb 71, 80p
Contract AT(29-2)-746

Descriptors: (*Aleutian islands, *Seismology).

For abstract, see NSA 28 03, number 07677.

CGS-746-113/GA PC$5.50/MF$1.45
National Ocean Survey, Rockville, MD.
ALEUTIAN SEISMIC PROGRAM SEISMOLOGICAL BULLETIN, NOVEMBER 1970.
Jun 71, 70p
Contract AT(29-2)-746

Descriptors: (*Aleutian islands, *Seismology).

For abstract, see NSA 28 02, number 05011.

CGS-746-115/GA PC$4.50/MF$1.45
National Ocean Survey, Rockville, MD.
IMPROVED BODY-WAVE MAGNITUDES OF ALEUTIAN EARTHQUAKES.
A. C. Tarr. May 71, 47p
Contract AT(29-2)-746

Descriptors: (*Aleutian islands, Earthquakes), (*Earthquakes, *Seismic detection), Seismic waves.

For abstract, see NSA 28 03, number 07678.

COM-73-11448/9GA PC$5.00/MF$1.45
Coast and Geodetic Survey, Rockville, Md.
THE PUGET SOUND, WASHINGTON, EARTHQUAKE OF APRIL 29, 1965.
Preliminary seismological engineering rept.,
S. T. Algermissen, Samuel T. Harding, Karl V. Steinbrugge, and William K. Cloud. 1973, 59p
NOAA-73082305
Errata sheet inserted.

Descriptors: (*Earthquakes, *Washington(State)), (*Puget Sound, Earthquakes), Statistical data, Geological faults, Seismic waves, Maps, Damage, Seismographs, Photographs.

On April 29, 1965, at 8:29 A.M. Pacific Daylight Savings Time, the Puget Sound, Washington region was shaken by the second largest earthquake since 1833. This report is a preliminary interpretation of seismological data obtained from permanent seismograph stations throughout the world, temporary seismograph stations established in the epicentral area immediately following the earthquake, intensity reports, and inspection of the epicentral area. Details are given on damages in Seattle, Tacoma, Olympia and neighboring cities.

IFA-R-2-1972/GA PC$3.00/MF$1.45
Institutul de Fizica Atomica, Bucharest (Romania).
SPATIAL FILTERING SYSTEM FOR HANDLING SEISMIC DATA.
V. Vasiliu, D. Apostol, and Z. Maris. 1972, 13p
U.S. Sales Only.

Descriptors: (*Seismic waves, *Optical filters), Fourier transformation.

For abstract, see NSA 28 03, number 07716.

NVO-746-11/GA PC$5.50/MF$1.45
National Oceanic and Atmospheric Administration, Las Vegas, Nev. Earth Sciences Labs.
ALEUTIAN SEISMIC PROGRAM HYPOCENTER SUMMARY, APRIL--SEPTEMBER 1972.
Apr 73, 68p
Contract AT(29-2)-746

Descriptors: (*Aleutian islands, *Seismology), Data processing.

For abstract, see NSA 28 03, number 05588.

NVO-746-12/GA PC$8.75/MF$1.45
National Oceanic and Atmospheric Administration, Las Vegas, Nev. Earth Sciences Labs.
PRELIMINARY SEISMICITY STUDY OF THE SOUTHERN NEVADA REGION. QUARTERLY REPORT, JANUARY--MARCH 1973.
May 73, 131p
Contract AT(29-2)-746

Descriptors: (*Nevada, *Seismology), (*Nevada test site, *Earthquakes), Monitoring.

For abstract, see NSA 28 03, number 05589.

PB-223 640/4GA PC$3.50/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
PRELIMINARY SEISMOLOGICAL BULLETIN, EASTER ISLAND STATION, MARCH 1970 - OCTOBER 1970.
Data rept. no. 20,
Nelson J. LeTourneau, and Rodolfo Piermattei.
Feb 71, 30p HIG-71-5
Grant NSF-GA-12851

Descriptors: (*Seismological stations, *Easter Island), Seismometers, Site surveys, Pacific Ocean.

A seismic station was installed and made operational in March 1970 on Easter Island in the southeast Pacific Ocean. Operation of the station is a cooperative effort between the University of Hawaii and the University of Chile. One long-period and three short-period seismometers are in operation. The data report lists arrivals at the Easter Island station from March through October, 1970.

PB-223 700/6GA PC$3.00/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
EVIDENCE OF A RELATION BETWEEN THE SEISMIC ENERGY RELEASED ALONG SPREADING AND SINKING EDGES OF THE NASCA PLATE,
Daniel A. Walker. Sep 71, 9p HIG-71-16
Grant NSF-GA-12851

Descriptors: (*Pacific Ocean, *Earthquakes), Continental drift, Seismology.
Identifiers: *Plate tectonics, Nasca plate.

A premliminary study shows that a temporal relationship exists between the seismic energy released along spreading edges of the Nasca Plate and that released along the sinking edge of the Plate. Dates and magnitudes of reported earthquakes along the spreading (western and southern) edges of the Plate were plotted and compared to similar data for earthquakes with magnitudes = or > 5.0 along the sinking (eastern) edge of the Plate for 1966 through 1970. Yearly totals were examined for the number of earthquakes in various magnitude ranges, the total number of earthquakes, and the total energy released by earthquakes. The data suggest a causal relationship between earthquake activity on the two edges of the Plate. A more comprehensive report in preparation presents additional evidence for such a relationship plus a discussion of the prediction of earthquakes along the west coast of the Western Hemisphere.

PB-223 751/9GA PC$4.50/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
SEISMOLOGICAL BULLETIN: NORTHWESTERN PACIFIC ISLANDS STATIONS, 1969.
Data rept. no. 19,
Charles S. McCreery. Feb 71, 49p HIG-71-4
Grants NSF-GA-1255, NSF-GA-12851
See also report dated Jan 70, PB-195 627.

Descriptors: (*Seismology, Technical reports), Seismological stations, Pacific Ocean Islands, Seismometers, Tables(Data).

Seismic stations were first installed on Wake, Marcus, and Midway islands in 1965. The following year, after some revisions had been made, data collection began. By 1969 all three stations had both short- and long-period seismometers in operation. The report contains lists of the events recorded by the three stations for the year 1969.

8L. Snow, Ice, and Permafrost

AD-767 248/8GA PC$2.75/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
EFFECTS OF STRATIGRAPHIC LAYERS ON WATER FLOW THROUGH SNOW.
Research rept.,
Samuel C. Colbeck. Sep 73, 21p Rept no. CREEL-RR-311

Descriptors: (*Snow, *Drainage), Permeability, Fluid flow, Glaciers, Hydrology.
Identifiers: Water flow, Stratification, Layers.

The flow of water through layered snowpacks is discussed. A method for predicting flow through unsaturated layers is given. The flow along ice layers and through ice layers is analyzed in terms of the slope, permeability, thickness and length of the layers. It is shown that the permeability of ice layers required to cause large flow diversions is quite small. The effect of slope is large even at small angles. (Author)

ANCR-1105/GA PC$7.60/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
TELEMETERED PROFILING ISOTOPIC SNOW GAUGE: FINAL REPORT AND SPECIFICATIONS.
P. D. Randolph, R. A. Coates, and E. W. Killian.
Apr 73, 327p
Contract AT(10-1)-1375

Descriptors: (*Snow, *Density), (*Level indicators, *Design), (*Densimeters, Design), Gamma radiation, Levels, Performance, Radiometric gages, Telemetry.

For abstract, see NSA 28 03, number 05804.

E73-11036/GA PC$3.00/MF$1.45
Environmental Research and Technology, Inc., Lexington, Mass.

STUDY TO DEVELOP IMPROVED SPACECRAFT SNOW SURVEY METHODS USING SKYLAB/EREP DATA.
Quarterly Progress rept., no. 2, 14 Jul-15 Sep 73,
James C. Barnes. 15 Sep 73, 5p ERT-P-412-4
NASA-CR-133882
Contract NAS9-13305

Descriptors: Snow cover, Cascade Range(CA-OR-WA), Sierra Nevada Mountains(CA), Utah, Mapping, EREP, Skylab program, Multispectral band scanners, Multispectral band cameras, Multispectral photography, Spectral reflectance.

The author has identified the following significant results. The initial analysis of EREP data from the SL-2 mission has been undertaken. Snow distributions are being mapped from the S190A photography for three mountain areas: the Sierra Nevadas; the Cascades near Washington-Oregon border; and the Wasatch Range in Utah. In the S192 screening film, a dramatic reversal in the reflectance of the snow in the Wasatch Range is observed between the visible and near IR channels. In channel 2 (0.46 - 0.51 microns) the snow has a high reflectance, whereas in channel 11 (1.55 - 1.75 microns) the snow appears almost black, having a much lower reflectance than the surrounding terrain. The sharp drop in reflectance in the near IR channel is believed to be due to the existance of melt water on the snow surface. Although investigators have reported this effect previously using ERTS-1 imagery, the S192 data provides the first opportunity to study quantitatively the snow reflectance in several visible and near IR channels. The results will have direct application for developing a technique to determine the condition of the snow surface (i.e., dry of melting), a significant parameter in snow hydrology.

E73-11037/GA PC$3.00/MF$1.45
Environmental Research and Technology, Inc., Lexington, Mass.
EVALUATE THE APPLICATION OF ERTS-A DATA FOR DETECTING AND MAPPING SEA ICE.
Bimonthly progress rept. no. 5, 10 Jul-10 Sep 73,
James C. Barnes. 27 Sep 73, 6p NASA-CR-133883
Contract NAS5-21802

Descriptors: Sea ice, Ice mapping, Ice reporting, Bering Sea, Beaufort Sea(North America), Arctic regions, Earth resources program, Ice floes, Ice formation.

The author has identified the following significant results. The results of the analysis of data collected during the spring and summer demonstrate that ERTS-1 imagery has a high potential for monitoring arctic sea ice conditions during the time of maximum ice extent through ice-breakup season. In the eastern Beaufort Sea area, the combination of ERTS-1 orbital overlap and a high incidence of cloud-free conditions during the spring assures a high frequency of repetitive satellite coverage. In the mid-Beaufort Sea, numerous fractures and leads can be identified, even in the early spring data. Ice features that can be identified include: development of fractures leading to the formation of distinct ice floes; growth and deterioration of leads; evidence of shearing movements of ice masses; formation of new grey ice within leads; distinction between grey-, grey-white, and older forms of ice; and the deterioration of the ice surface evidenced by the formation of puddles, thaw holes, and drainage patterns. Ice conditions in the Bering Sea near St. Lawrence Island reported by aircraft observers participating in the Bering Sea Expedition are in close agreement with the ice conditions mapped from the corresponding ERTS-1 imagery. Ice features identified were: boundaries between grey ice and first year ice, shear leads, and occurrence of open water.

8M. Soil Mechanics

AD-767 557/2GA PC$4.75/MF$1.45
Stevens Inst of Tech Hoboken N J Davidson Lab
SOIL MACHINE STUDIES: THE EFFECTS OF SHEAR RING AND GROUSER SIZE ON SOIL SHEAR MEASUREMENTS.
Final rept.,
Joseph C. Borst. Sep 73, 167p Rept no. SIT-DL-73-1677
Contract DAAE07-73-0131

Descriptors: (*Soil mechanics, Test methods), Shear stresses, Loading(Mechanics), Internal friction, Deformation, Soils, Numerical analysis.

Tests were conducted with a Bevameter in three soils with six shear rings or annuli, three of which were modeled geometrically. Three grouser-to-outer diameter ratios with five loads in sand clay (11.1% water) and with three loads in ships for shear torque, coefficient of internal friction, and cohesion were derived from a dimensional analysis of selected primary parameters. Tests were conducted to evaluate the unknowns in the general expressions. (Modified author abstract)

BNWL-CC-815/GA PC$3.00/MF$1.45
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
SOIL--CALCITE--STRONTIUM RELATIONSHIPS.
L. L. Jr. Ames, and B. F. Hajek. 6 Sep 66, 18p
Contract AT(45-1)-1830

Descriptors: (*Soils, *Sorptive properties), (*Hapo, *Radioactive waste disposal), (*Strontium isotopes, *Adsorption), (*Cesium isotopes, Adsorption), Calcite, Chemical composition, Column packing, Ion exchange, Measuring methods, Radioisotope scanning, Radionuclide migration, Scintiscanning, Tracer techniques, Underground disposal.

For abstract, see NSA 28 03, number 05524.

COO-1495-22/GA PC$3.75/MF$1.45
Purdue Univ., Lafayette, Ind.
MOVEMENT OF STRONTIUM THROUGH THE SOIL TO THE PLANT ROOT MEMBRANE. PROGRESS REPORT, SEPTEMBER 1, 1972--AUGUST 31, 1973.
S. A. Barber, and G. L. Malzer. 1973, 32p
Contract AT(11-1)-1495

Descriptors: (*Calcium, *Root absorption), (*Strontium, Root absorption), Plants, Soils.

For abstract, see NSA 28 03, number 07695.

N73-27326/0GA PC$3.00/MF$1.45
Washington Univ., Seattle. Coll. of Forest Resources.
IONIC MIGRATION AND WEATHERING IN FROZEN ANTARCTIC SOILS.
F. C. Ugolini, and D. M. Anderson. Jul 73, 26p
NASA-CR-2283
Contract NGR-50-001-153

Descriptors: *Antarctic regions, *Ion motion, *Soils, *Weathering, Chemical reactions, Sodium isotopes.

For abstract, see STAR 1118

N73-28445/7GA PC$14.25/MF$1.45
California Univ., Berkeley. Space Sciences Lab.
STATIC PENETRATION RESISTANCE OF SOILS.
H. T. Durgunoglu, and J. K. Mitchell. Apr 73, 243p
NASA-CR-133460, SSL-SER-14-ISSUE-24
Contract NGR-05-003-406

Descriptors: *Mathematical models, *Penetration, *Soil mechanics, Cohesion, Friction factor, Lunar soil, Penetrometers, Surface roughness.

For abstract, see STAR 1119

PB-223 946/5GA PC$4.00/MF$1.45
Federal Highway Administration, Washington, D.C. Materials Div.
SOIL SHEAR STRENGTH.
Staff study (Final),10Stephen F. Obermeier.
Jun 73, 39p FHWA-RD-73-47
Prepared by Soils and Exploratory Techniques Group.

Descriptors: (*Soil tests, Shear strength), (*Clay soils, Shear strength), (*Vane shear tests, Clay soils), Tests.

The vane device offers a simple means for taking shear strength measurements of weak or sensitive clayey soils. So the engineer could better determine how to interpret the test data, this study was undertaken to clarify the influence of testing variables and of in-situ stress and strain conditions on vane shear strength data. The data clearly showed that the measured shear strength of a clay soil is dependent on the test speed. This dependence is probably a function of two independent variables--effective stresses and shear strength properties of the soil.

8N. Terrestrial Magnetism

N73-27338/5GA PC$4.50/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Research.
THE RELATION BETWEEN THE AZIMUTHAL COMPONENT OF THE INTERPLANETARY MAGNETIC FIELD AND THE GEOMAGNETIC FIELD IN THE POLAR CAPS.
L. Svalgaard. May 73, 49p NASA-CR-133273, SU-IPR-521
Contracts NGR-05-020-559, N00014-67-A0112-0068
Conf-Presented at 7TH Eslab Symp., Saulgau, West Germany, 22-25 May 1973.

Descriptors: *Azimuth, *Geomagnetism, *Interplanetary magnetic fields, *Polar caps, Magnetic poles, Perturbation, Sunspots.

For abstract, see STAR 1118

PB-223 208/0GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 1,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-019
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity: or 9 track, 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 209/8GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.

MAGNETIC AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 2,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-020
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 PBI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing.The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 210/6GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Barlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 3,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-021
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 PBI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 211/4GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 4,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-022
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity: or 9 track, 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 212/2GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 5,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-023
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity: or 9 track, 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 213/0GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 6,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-024
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 214/8GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 7,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-025
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 215/5GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 8,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-026
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 216/3GA
Mag Tape $97.50; Foreign $122.50
Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.
MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 9,
John C. Behrendt, and Cletus S. Wotorson. 1973,
2400 ft mag tape USGS-GD-73-027
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity: or 9 track, 800 BPI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates in icated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

PB-223 217/1GA

Mag Tape $97.50; Foreign $122.50

Lockwood, Kessler, and Bartlett, Inc., Great Neck, N.Y.

MAGNETIC, AND RADIOMETRIC DATA OF LIBERIA WEST AFRICA. AREA BLOCK 10,

John C. Behrendt, and Cletus S. Wotorson. 1973, 2400 ft mag tape USGS-GD-73-028

Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 PBI, odd parity.

Descriptors: (*Magnetic surveys, *Liberia), (*Natural radioactivity, Liberia), Magnetic tapes, Aerial surveys, Gamma rays.

Aeromagnetic and total count gamma radiation data were observed over Liberia, West Africa, in 1967-68. These data have been digitized, gridded, and additionally processed and are presented here in magnetic tape suitable for computer plotting or additional processing. The data are referenced to the Liberian Hotine Rectified Skew Orthomorphic projection and rectangular coordinates indicated on published maps of Liberia. The 5 files of data consist of: (1) Total count gamma radiation, (2) total magnetic intensity relative to an arbitrary datum, (3) regional magnetic component (with main earths field removed), (4) near surface (residual) magnetic component, and (5) correlation function (near-surface magnetic-total count gamma radiation). The magnetic data have been analyzed using the method of Spector and Grant (1970); the correlation function was calculated by a method developed by A. Spector.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-767 054/0GA PC$2.75/MF$1.45

Princeton Univ N J Solid State and Materials Lab

OXIDE CHARGE TRAPPING INDUCED BY ION IMPLANTATION IN SIO2.

Technical rept.,

Eli Harari, and Barrie S. H. Royce. 24 Sep 73, 9p

Rept no. PSSL-240973

Contract N00014-67-A-0157-0026

See also AD-767 055.

Descriptors: (*Semiconductor devices, Radiation damage), (*Capacitors, Ion bombardment), Silicon dioxide, Electrical conductance, Annealing, Ions, Sodium, Aluminum.

Identifiers: Metal insulator semiconductors, Ion implantation, Radiation hardening, Photoelectric emission.

Experimental measurements directed at understanding oxide modifications induced by Na+ and Al+ ion implantation are described. Both implanted species created high dark conductivity in unannealed specimens. This had a temperature dependence independent of ion type suggesting that the conductivity is related to displacement damage. Internal photoemission studies showed that Na+ implantation had produced a barrier lowering at both interfaces and also permitted subthreshold photoemission starting with photons of about 1 eV. Thermal annealing returned the oxide to its insulating state and removed the subthreshold photoemission. Photodepopulation measurements indicated that the oxide still contained electron traps not present in the unimplanted samples. (Author)

AD-767 055/7GA PC$2.75/MF$1.45

Princeton Univ N J Solid State and Materials Lab

THE EFFECTS OF ELECTRON AND HOLE TRAPPING ON THE RADIATION HARDNESS OF AL2O3 MIS DEVICES.

Technical rept.,

Eli Harari, and Barrie S. H. Royce. 25 Sep 73, 16p

Rept no. PSSL-250973

Contract N00014-67-A-0151-0026

See also AD-764 054.

Descriptors: (*Semiconductor devices, Radiation damage), (*Capacitors, Radiation damage), Photon bombardment, X rays, Aluminum compounds, Oxides.

Identifiers: Metal insulator semiconductors, Aluminum oxides, Radiation hardening, Electron traps, Hole traps, Carrier recombination.

The radiation sensitivity of MIS capacitors with pyrohydrolytic Al2O3 insulators has been investigated for X-irradiation at 300 and 80K. Both X-rays and light of various photon energies were used to vary the populations of electron and hole traps inherent in the 'as prepared' films. The energies of the trapping levels have been determined and the spatial distribution of the electron traps within the oxide estimated. These traps together with an SiO(x) layer at the semiconductor-oxide interface are shown to control the device behavior under ionizing radiation. (Author)

AD-767 225/6GA PC$4.25/MF$1.45

Cornell Univ Ithaca N Y

ADVANCED CONCEPTS OF MICROWAVE GENERATION AND CONTROL IN SOLIDS.

Technical rept., 1 Jan-31 Mar 73,

G. C. Dalman, L. F. Eastman, C. A. Lee, and F. Frey. Jul 73, 110p RADC-TR-73-196

Contract F30602-71-C-0110

Descriptors: (*Microwave oscillators, *Diodes(Semiconductor)), Microwave amplifiers, Harmonic generators, Avalanche diodes, Silicon, L band, X band, Field effect transistors, Gallium arsenides, Indium compounds, Phosphides, Ionization, Doping, Epitaxial growth.

Identifiers: TRAPATT diodes, LSA diodes, Schottky barrier diodes, BARITT diodes, Indium phosphides, Ion implantation.

Contents: Multi-Mesa TRAPATT fabrication, high frequency high efficiency avalanche oscillators, high frequency Pt-n-p+ diodes, BARITT devices, microwave field-effect transistors, amplifier properties, computer experiments on TRAPATT diodes, c.w. high performance TEO, growth and evaluation of InP for LSA oscillations, ion implantation and diffusion, ionization rates in GaAs, vacuum epitaxial growth in silicon, gallium arsenide microwave monolithic integrated circuit study.

AD-767 272/8GA PC$3.00/MF$1.45

Westinghouse Electric Corp Baltimore Md Systems Development Div

BINARY-ADDRESSABLE SCAN-CONVERSION STORAGE TUBE.

Quarterly rept. no. 6, 15 Jan-14 Apr 73,

Haden J. Bourg, and Gary E. Marx. Aug 73, 39p

ECOM-0052-6-72

Contract DAAB07-72-C-0052

See also Quarterly rept. no. 5, AD-761 099.

Descriptors: (*Storage tubes, Design), Electron tube parts, Manufacturing methods.

The objective of the contract is to conduct a research and development program leading to the fabrication, testing, and delivery of a binary-addressable scan-conversion storage tube. The tube is to be capable of simultaneous write and nondestructive read operation at video frequencies up to 10 megahertz. During this quarter the initial device was fabricated and tested using a circuit which allowed selection of any single electrode on the wafers in the stack. Additional etching experiments were conducted in an effort to evaluate the possibility of etching the hole arrays in the digitizer plates. A digital addressing system which should operate at 10 megahertz has been designed. This system will provide sufficient information to display a bar chart exhibiting eleven shades of gray in a sequential manner. It also allows demonstration of the random access capability to the individual target elements. (Modified author abstract)

AD-767 287/6GA PC$6.25/MF$1.45

Rockwell International Corp Anaheim Calif Electronics Group

FUNDAMENTAL STUDIES OF SEMICONDUCTOR HETEROEPITAXY.

Final rept. (Part 1), Jun 70-30 Jun 73,

Ralph P. Ruth, A. James Hughes, Joseph L. Kenty, Harold M. Manasevit, and Arthur C. Thorsen. Aug 73, 273p* Rept no. C71-86/501-Pt-1

Contract DAAH01-70-C-1311, ARPA Order-1585

See also Part 2, AD-767 288 and Part 3, AD-767 289.

Descriptors: (*Semiconducting films, Crystal growth), (*Semiconductor devices, Manufacturing methods), Epitaxial growth, Silicon, Gallium arsenides, Substrates, Vapor plating, Annealing, Reaction kinetics, Etching, Sputtering.

Identifiers: Chemical vapor deposition, Aluminum oxides, Heteroepitaxial films.

Contents:

- Theory of epitaxy and heteroepitaxial interfaces;
- Deposition studies and film preparation;
- Analysis and purification of chemical vapor deposition (CVD) reactants;
- Chemistry and reaction kinetics of CVD processes;
- Preparation and characterization of substrates;
- Al2O3 characterization by carrier injection and transport measurements.

AD-767 288/4GA PC$5.50/MF$1.45

Rockwell International Corp Anaheim Calif Electronics Group

FUNDAMENTAL STUDIES OF SEMICONDUCTOR HETEROEPITAXY,

Final rept. (Part 2), Jun 70-30 Jun 73,

Ralph P. Ruth, A. James Hughes, Joseph L. Kenty, Harold M. Manasevit, and Arthur C. Thorsen. Aug 73, 220p Rept no. C71-86/501-Pt-2

Contract DAAH01-70-C-1311, ARPA Order-1585

See also Part 1, AD-767 287 and Part 3, AD-767 289.

Descriptors: (*Semiconducting films, Crystal growth), (*Semiconductor devices, Manufacturing methods), Epitaxial growth, Silicon, Vapor plating, Substrates, Aluminum compounds, Oxides, Electron microscopy, Electrical properties, Solar cells.

Identifiers: Chemical vapor deposition, Aluminum oxides, Charge coupled devices, Schottky barriers, Heteroepitaxial films.

Contents:

- Studies of in situ film growth in the electron microscope;
- Electrical properties of heteroepitaxial films;
- Anisotropy in electrical properties of Si films on Al2O3;
- Miscellaneous structural evaluations of heteroepitaxial semiconductor films;

Design and fabrication of special devices.

AD-767 289/2GA PC$4.75/MF$1.45
Rockwell International Corp Anaheim Calif Electronics Group
FUNDAMENTAL STUDIES OF SEMICONDUCTOR HETEROEPITAXY.
Final rept. (Part 3, Appendices), Jun 70-30 Jun 73,
Ralph P. Ruth, A. James Hughes, Joseph L. Kenty, Harold M. Manasevit, and Arthur C. Thorsen. Aug 73, 159p Rept no. C71-86/501-Pt-3
Contract DAAH01-70-C-1311, ARPA Order-1585
See also Part 1, AD-767 287 and Part 2, AD-767 288.

Descriptors: (*Semiconducting films, Crystal growth), (*Semiconductor devices, Manufacturing methods), Epitaxial growth, Vapor plating, Substrates, Aluminum compounds, Oxides, Work functions, Electrical properties, Anisotropy, Stresses, Electron microscopy.
Identifiers: Chemical vapor deposition, Aluminum oxides, Heteroepitaxial films.

Contents:
- Work functions and surface double layer potentials of monovalent metals from a network model;
- Anisotropy in electrical properties of (001)Si(0112)Al2O3;
- Anisotropy in the electrical properties of N-type (221)Si/(1122)Al2O3;
- Stress induced anisotropy in the electrical properties of Si/Al2O3;
- Bibliography - electron microscope in situ nucleation and growth studies;
- Electron scattering by gaseous atoms;
- Preliminary EM6 modifications for in situ chemical vapor deposition.

AD-767 338/7GA PC$3.75/MF$1.45
RCA Labs Princeton N J
YELLOW LUMINESCENT DIODES.
Final rept. 1 Jan 71-31 Dec 72,
Charles J. Nuese. Jan 73, 94p* Rept no. PRRL-73-CR-7
Contract N00014-71-C-0198

Descriptors: (*Photodiodes, Manufacturing methods), Indium compounds, Gallium compounds, Phosphides, Epitaxial growth, Electroluminescence, Diodes(Semiconductor), Doping.
Identifiers: *light emitting diodes, Gallium phosphides, Indium phosphides, Photoluminescence, Chemical vapor deposition, Performance evaluation, *Electroluminescent diodes.

The authors review the vapor-phase growth technology used for the preparation of the epitaxial layers, and follow this by a section concerned with alloy homogeneity, one of the more important papameters for the preparation of high-quality in (1-x)Ga(x)P. The problems associated with lattice mismatch in epitaxial growth is discussed, the three types of epitaxy-substrate structures prepared are described. The p-n junctions prepared on GaAs substrates are described, and it is shown that very high quality light-emitting diodes can be obtained when an In(1-x)Ga(x)P alloy composition that has the same lattice constant as the GaAs substrate is used. The growth of In(1-x) Ga(x)P substrates is treated and the high-resistance problems that were consistently observed for such structures due to a variety of technological complications are described. The results obtained with the three different types of structures are compared, and the features and limitations of each are described. (Author)

AD-767 340/3GA PC$6.50/MF$1.45
Minnesota Univ Minneapolis Dept of Electrical Engineering
AN INVESTIGATION OF AG-O-CS PHOTOEMISSIVE SURFACES USING AUGER ELECTRON SPECTROSCOPY.
Technical rept.,
Thomas W. Rusch. Aug 73, 280p Rept no. TR-73-01
Contract N00014-68-A-0141-0002

Descriptors: (*Photocathodes, Photosensitivity), Design, Semiconducting films, Silver, Cesium compounds, Oxides, Photoelectric effect, Ultraviolet radiation, Light, Infrared radiation, Vapor plating, Work functions, Electron spectroscopy.
Identifiers: Auger electron spectroscopy, Chemical vapor deposition.

An investigation of the relationship between the photoemissive characteristics and the surface elemental compositon of Ag-O-Cs photocathodes was carried out. In support of this investigation it became desirable to examine the validity of the photocathode model proposed by Borziak, Bibik, and Kramerenko with respect to more recently acquired photoelectron energy distribution (EDC) and Auger electron emission data. The basis for this model is that the Ag-O-Cs photocathode is a composite of metallic silver particles dispersed in a cesium oxide matrix. With this premise, the photoelectric sensitivity in the ultraviolet (lambda < 300 nm) is ascribed to the cesium oxide and that in the visible and infrared (lambda > 300 nm) to the metallic silver particles. (Author)

AD-767 365/0GA PC$3.75/MF$1.45
Alabama Univ University Bureau of Engineering Research
THE DETERMINATION OF SEMICONDUCTOR JUNCTION VULNERABILITY TO SECOND BREAKDOWN BY LOW ENERGY ELECTRICAL MEASUREMENTS.
Final rept. 12 Apr 72-15 Jun 73,
Wilford D. Raburn, Wayne H. Causey, Edward C. Friday, and Hamish H. Wong. 30 Jul 73, 95p* Rept no. BER-155-93
Contract DAAH01-72-C-0734

Descriptors: (*Diodes(Semiconductor), Failure(Electronics)), (*Transistors, Failure(Electronics)), Electric currents, Resistance(Electrical), Voltage, Capacitance.
Identifiers: Semiconductor junctions, *Second breakdown.

The possibility of correlations between second breakdown energy characteristics and low level junction parameters for diodes was investigated. The low level parameters considered were ac resistance in the first breakdown region, reverse current, first breakdown voltage, breakdown voltage of the first microplasma region, and the resistivity of the high resistivity side of the junction. The diodes studied consisted of the collector-base junctions of the 2N2222, 2N2862, and 2N3304 bipolar transistors. No correlations between low level electrical measurements and second breakdown energy evaluated for a 1 millisecond pulse width were observed for any group of devices or for any comparison between device types. (Author)

AD-767 401/3GA Reprint
Arizona State Univ Tempe Solid State Research Lab
THE INHOMOGENEOUS CHANNEL FET: ICFET,
Thomas A. DeMassa, and Genard T. Catalano. 20 Dec 72, 7p AFOSR-TR-73-1861
Contract F44620-69-C-0025
Revision of report dated 6 Nov 72.
Availability: Pub. in Solid State Electronics, v16 p847-851 1973.

Descriptors: (*Field effect transistors, Electrical properties), Doping, Gain, Bandwidth.
Identifiers: Inhomogeneous channel field effect transistors, Ion implantation.

Improvement in the operation of field-effect transistors is predicted through the use of various longitudinal inhomogeneous channel resistivity profiles with heavier doping concentration near the source than the drain end of the channel. The inhomogeneous channel field-effect transistor or ICFET is shown to have a marked improvement in cut-off frequency, device gain, output power and gain-bandwidth product regardless of the actual profile providing only that the doping concentration is higher near the source than the drain end of the channel. The various ICFETs analyzed and compared with the homogeneous FET are the following: linear, Gaussian, complementary error function and exponential. Solutions for each of these cases with doping concentration changes of 10 to 1 and 100 to 1 between the source and drain ends were obtained. The linear case with a 100 to 1 change in doping concentration is seen to provide tremendous device operation improvement, i.e. gain or power is improved by a factor of 30.7 and gain bandwidth by a factor of 955. (Author)

AD-767 549/9GA PC$3.50/MF$1.45
Stanford Univ Calif Microwave Lab
SURFACE WAVE PARAMETRIC PROCESSORS AND LONG DELAY LINES.
Final rept. 1 Mar 71-31 Mar 73,
M. Chodorow, H. J. Shaw, G. S. Kino, D. K. Winslow, and W. L. Bond. Jul 73, 75p Rept no. ML-2180 ECOM-0145-F-71
Contract DAAB07-71-C-0145

Descriptors: (*Delay lines, Ultrahigh frequency), Semiconducting films, Transducers, Waveguides, Parametric amplifiers, Bismuth compounds, Germanium compounds, Oxides, Piezoelectric crystals, Lithium compounds, Niobates.
Identifiers: *Acoustic surface waves, Surface waves, Acoustic wave amplifiers, Acoustic delay lines, Signal processing Bismuth oxides, Germanium oxides, Crosstalk, Interdigital transducers, Lithium niobates, Thin films.

The program is concerned with very long time delays, variable parametric processing and, toward the end, initial calculations and projections concerning the feasibility of integrating large bandwidths into the long delay lines which have been developed. Section II describes thin-film waveguides for surface acoustic waves, of electric-field and slot types, having very low loss and low dispersion. They are well suited for use on wrap-around type surface wave delay lines. Section III deals with helical forms of wrap-around delay lines which provide passive, non-dispersive two-port operation. The construction of lines for one-half millisec time delays is described. Designs for larger delays are shown to be feasible, and designs for maximizing the amount of data storage per unit of delay line area are shown. Section IV is concerned with parametric signal processing, including cross correlation and pulse compression, covering terminal operating characteristics of surface wave versions of these devices operating at input frequency of 100 MHz. Substantial increase in dynamic range is described. Section V contains initial calculations and predictions with regard to incorporating extreme broadbanding techniques, as applied to interdigital transducers, into very long delay lines. (Author)

AD-767 595/2GA PC$44.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ELECTRICAL CABLES, WIRE, AND CORDS,
D. S. Bachelis, N. I. Belorussov, and A. E. * * Saakyan. 6 Aug 73, 836p Rept no. FTD-HC-23-1376-72
Edited trans. of mono. Elektricheskie Kabeli, Provoda i Shnury, Moscow, 1971 p1-704.

Descriptors: (*Electric cables, Handbooks), (*Electric wire, Handbooks), Design, Structural properties, Electrical properties, Data, USSR.
Identifiers: Translations.

The reference book contains descriptions of the basic structural elements of cables, wires, and cords, the bases of electrical calculation of cables and wires, and a brief description of the structures and characteristics of the basic cables, wires, and cords produced by the cable industry of the USSR.

The reference book presents data on the permissible loads in cables and wire, and basic recommendations on areas of application of the cables and wires produced. Data are also presented on cable packaging and methods of testing cables and wires. The supplement to the reference book presents auxiliary tables for calculating cables, wires and cords.

AD-767 619/0GA PC$4.50/MF$1.45
General Electric Co Auburn N Y Semiconductor Products Dept
200 AMPERE GATE CONTROLLED SWITCH.
Final technical rept. 1 Jun 71-30 Apr 73,
E. Duane Wolley, Frederick M. Matteson, Robert L. Steigerwald, and Rosendo U. Yu. Aug 73, 150p AFAPL-TR-73-39
Contract F33615-71-C-1729

Descriptors: (*Electronic switches, Semiconductor devices), Circuit breakers, Inverters, Design.
Identifiers: *Thyristors, *Turn off thyristors.

A 200A gate turn-off thyristor was developed along with a device tester, inverter, and circuit breaker. Devices capable of interrupting 200 Amps in 1.0 microsecond with a forced turn-off gain of 5 were obtained. The inverter and circuit breaker use these devices. The theory of operation for both devices and circuits are presented. Fabrication techniques are also presented. (Author)

AD-767 659/6GA PC$4.25/MF$1.45
Naval Postgraduate School Monterey Calif
AN INVESTIGATION ON THE APPLICATION OF THE METHOD OF PARTIAL IMAGES TO A DYNAMIC PROBLEM.
Master's thesis,
John Francis Timony. Jun 73, 45p

Descriptors: (*Dipole antennas, Electrical impedance), Electrostatic fields, Dielectrics, Admittance, Green's functions, Matrix algebra, Computer programs, Theses.
Identifiers: Method of moments, Image processing, Monopole antennas.

The method of partial images has been successfully applied to electrostatic problems involving conductors on a dielectric substrate. This same method is investigated for its adaptation to dynamic problems. A Green's Function is derived and applied to the problem of a wire dipole antenna on a dielectric substrate. The input admittance of the antenna is computed by the method of moments. Experimentally measured values of input admittance are compared with the theoretical values and the error is discussed. (Author)

BDX-613-773/GA PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo.
ELECTRICAL TERMINATIONS: WELDED, BRAZED, AND BONDED, FY72-4. QUARTERLY REPORT.
D. E. Stittsworth. Mar 73, 35p
Contract AT(29-1)-613

Descriptors: (*Connectors, *Joining), Arc welding, Control, Electric contacts, Spot welding, Standards, Ultrasonic welding, Welding machines, Copper, Copper oxides, Wires, Embrittlement, Hydrogen, Brazing, Nickel.

For abstract, see NSA 28 03, number 07657.

BDX-613-877/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
MICROHM DECADE RESISTOR. SPECIAL SPINOFF REPORT.
G. E. Kator. May 73, 16p
Contract AT(29-1)-613

Descriptors: (*Resistors, *Design), Performance, Resolution.

For abstract, see NSA 28 03, number 07659.

CEA-CONF-2232/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
D.C. MAGNETS.
G. Bronca. 13 Oct 72, 40p CONF-721086-1
U.S. Sales Only.

Descriptors: Cooling, Direct current, Electric conductors, Fabrication, Shielding, Superconducting magnets.

For abstract, see NSA 28 03, number 06920.

CONF-730105-3/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
PRECISION EMF MEASUREMENTS ON PROTOLYTIC EQUILIBRIA WITH THE HYDROGEN ELECTRODES ABOVE 100 EXP 0 C.
R. E. Mesmer, F. H. Sweeton, B. F. Hitch, and C. F. Jr. Baes. 1972, 34p

Descriptors: (*Electrodes, *Electric potential), (*Hydrogen, Electrodes), Electrochemistry, Equilibrium, Medium temperature.

For abstract, see NSA 28 03, number 07679.

COO-3120-3-A/GA PC$3.00/MF$1.45
Princeton Univ., N.J. Joseph Henry Labs.
WAVELENGTH DEPENDENCE OF CATHODE NON-UNIFORMITIES IN IMAGE INTENSIFIERS. TECHNICAL REPORT 14.
G. T. Reynolds, P. Jr. Botos, and S. Gruner. 3 Jan 73, 8p
Contract AT(11-1)-3120

Descriptors: (*Image intensifiers, *Cathodes), Sensitivity.

For abstract, see NSA 28 03, number 07706.

FRNC-TH-357/GA PC$7.60/MF$1.45
Paris Univ., Orsay (France).
UTILIZATION OF ION IMPLANTATION IN THE MANUFACTURE OF SEMICONDUCTOR RADIATION DETECTORS. APPLICATION TO POSITION SENSITIVE DETECTORS.
B. Waast. 1972, 207p
In French. U.S. Sales Only.

Descriptors: (*Silicon, *Ion implantation), (*Si semiconductor detectors, Ion implantation), Boron ions, Crystal doping, Energy resolution, Fabrication, Junction diodes, Lithium ions, Performance, Phosphorus ions, Position sensitive detectors, Semiconductor materials, Spatial resolution, Surface barrier detectors.

For abstract, see NSA 28 02, number 02652.

N73-27154/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
VAMISTOR RESISTOR INVESTIGATION.
1 May 73, 221p NASA-TM-X-64754

Descriptors: *Failure analysis, *Nondestructive tests, *Resistors, Chemical analysis, Metallography, Seals (Stoppers), Stresses.

For abstract, see STAR 1118

N73-27597/6GA PC$4.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
DEVICE FOR CONTINUOUSLY VARIABLE PULSE DELAY ETUDE D'UN DISPOSITIF POUR DONNER A DES IMPULSIONS UN RETARD REGLABLE DE MANIERE CONTINUE RAPPORT FINAL.
Final Report.
P. Defranould. 3 Dec 71, 39p
Contract DRME-70/34-202-00-480-75-01
Language in French.

Descriptors: *Acoustic delay lines, *Acousto-optics, *Ultrahigh frequencies, Elastic waves, Electromagnetic pulses, Phonons, Photons, Piezoelectric transducers.

For abstract, see STAR 1118

N73-28025/7GA PC$3.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
STUDY OF WIDEBAND UHF FERRITE DEVICES ETUDE DE DISPOSITIFS UHF A FERRITE A TRES LARGE BANDE.
1972, 5p
Contract DRME-69/34-539-00-480-75-01
Language in French.

Descriptors: *Circulators (Phase shift circuits), *Ferrites, *Microwave equipment, *Superhigh frequencies, Broadband, Insertion loss, Strip transmission lines, Yttrium-iron garnet.

For abstract, see STAR 1119

N73-28026/5GA PC$3.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
SYNTHESIS AND LOW AND HIGH LEVEL UHF PROPERTIES OF HOT PRESSED MANGANESE/MAGNESIUM FERRITES OF THE SPINEL TYPE FOR X BAND APPLICATIONS ETUDE DE LA SYNTHESE ET DES PROPRIETES EN BAS ET HAUT NIVEAU UHF D'UN FERROSPINELLE DE MANGANESE ET MAGNESIUM PRESSE A CHAUD, UTILISABLE EN BANDE X.
J. Nicolas, R. Sroussi, and A. Hermosin. 1972, 5p
Contract DRME-69/34-539-00-480-75-01
Language in French.

Descriptors: *Ferrites, *Hot pressing, *Spinel, *Ultrahigh frequencies, Circulators (Phase shift circuits), Garnets, Magnesium compounds, Magnetic properties, Manganese compounds, Microstructure, Strip transmission lines, Surface properties.

For abstract, see STAR 1119

N73-28085/1GA PC$24.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FLAT CONDUCTOR CABLE DESIGN, MANUFACTURE, AND INSTALLATION.
W. Angele, and J. D. Hankins. 16 Apr 73, 438p NASA-TM-X-64750

Descriptors: *Flat conductors, *Production engineering, *Transmission lines, Equipment specifications, Quality control, Systems engineering.

For abstract, see STAR 1119

N73-28087/7GA PC$4.75/MF$1.45
Westinghouse Electric Corp., Elmira, N.Y. Electronic Tube Div.
APOLLO TELESCOPE MOUNT SEC CAMERA TUBE SPARES PROGRAM.
Final Report.
M. Green, and R. D. Harder. Jun 73, 51p NASA-CR-124342
Contract NAS8-29063

Descriptors: *Apollo telescope mount, *Spare parts, *Thermionic cathodes, Camera tubes, Maintenance, Reliability engineering.

For abstract, see STAR 1119

ORNL-TM-4107/GA PC$12.75/MF$1.45
Oak Ridge National Lab., Tenn.
ANALYSIS OF REFLECTION TYPE COILS FOR EDDY-CURRENT TESTING.
C. V. Dodd, C. C. Cheng, W. A. Simpson, D. A. Deeds, and J. H. Smith. Apr 73, 211p
Contract W-7405-eng-26

Descriptors: (*Electric coils, *Design), (*Eddy current testing, Electric coils), (*Nuclear fuels, Eddy current testing), (*Computer codes, *M codes), Fortran, Pdp computers, Performance, Probes, R codes, Reflection.

For abstract, see NSA 28 02, number 02519.

ORNL-TM-4198/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
CALCULATION OF RADIAL MAGNETIC FIELDS FOR AXISYMMETRIC SOLENOIDS WITH RECTANGULAR CROSS SECTION.
P. L. Walstrom, and M. S. Lubell. Apr 73, 19p
Contract W-7405-eng-26

Descriptors: (*Superconducting magnets, *Magnetic fields), (*Solenoids, *Superconductors), Configuration, Critical current, Magnetic flux, Surfaces.

For abstract, see NSA 28 02, number 04014.

PAT-APPL-226 472/GA PC$3.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
FILAMENT SUPPORT STRUCTURE FOR LARGE ELECTRON GUNS.
Patent Application,
Robert E. Stapleton, John F. Weinbrecht, Edward O. Ferdinand, and James J. Hayden. Filed 15 Feb 72, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Holders, *Patent applications), (*Electron guns, *Electron tube heaters), Leaf springs, Supports, Laser amplifiers, Materials replacement.
Identifiers: PAT-CL-331-94.5.

The patent application relates to an electron gun filament support structure in which the electron-emitting filaments are held in place by a plurality of opposing leaf springs. In a preferred embodiment, the springs are mounted on a filament tray, with the leaf of each spring extending substantially perpendicularly to the tray. Each leaf has one or more slots in its upper edge. The arms of each slot curve substantially outwardly from the opposing leaf springs, whereby a filament having enlarged end portions inserted in the slots of opposing leaf springs is held firmly in place under tension. Damaged or destroyed filaments may readily be removed and new filaments inserted by pressing opposed leafs toward each other, removing one filament, inserting another, and releasing the springs.

PATENT-3,742,316/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
WIDE TEMPERATURE RANGE ELECTRONIC DEVICE WITH LEAD ATTACHMENT.
Patent.
R. Farrell. Patented 26 Jun 73, 5p NASA-CASE-ERC-10224-2,
Misc-Filed 28 Jan. 1972 Supersedes N72-21253 (10 - 12, p 1587). Subm-Continuation-in-Part of US Patent Appl. Sn-868775, Filed 23 Oct. 1969.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Attachment, *Diodes, *Electrodes, *Metal coatings, Backward wave tubes, Patents, Production engineering, Silicon carbides.

A electronic device including lead attachment structure which permits operation of the devices over a wide temperature range is reported. The device comprises a core conductor having a thin coating of metal thereon whereby only a limited amount of coating material is available to form an alloy which bonds the core conductor to the device electrode, the electrode composition thus being affected only in the region adjacent to the lead.

PATENT-3 244 943/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
CONTINUOUS MAGNETIC FLUX PUMP.
Patent.
A. F. Hildebrandt, D. D. Elleman, and F. C. Whitmore. Patented 5 Apr 66, 6p NASA-CASE-XNP-01187,
Misc-Filed 29 Nov. 1961. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Magnetic flux, *Magnetic pumping, Magnetic materials, Patents, Superconductivity.

A method and means for altering the intensity of a magnetic field by transposing flux from one location to the location desired fro the magnetic field are examined. The device described includes a pair of communicating cavities formed in a block of superconducting material, is dimensioned to be insertable into one of the cavities and to substantially fill the cavity. Magnetic flux is first trapped in the cavities by establishing a magnetic field while the superconducting material is above the critical temperature at which it goes superconducting. Thereafter, the temperature of the material is reduced below the critical value, and then the exciting magnetic field may be removed. By varying the ratios of the areas of the two cavities, it is possible to produce a field having much greater flux density in the second, smaller cavity, into which the flux transposed.

PATENT-3 680 009/GA Not available NTIS
Department of the Air Force Washington D C
ACOUSTIC SURFACE WAVE DELAY LINE.
Patent,
Andrew J. Slobednik, Jr. Filed 18 Mar 71, patented 25 Jul 72, 4p Rept nos. PAT-APPL-125 572,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Delay lines, *Patents), (*Microwave equipment, Delay lines), Lithium compounds, Niobates.
Identifiers: PAT-CL-333-30, *Acostic surface waves, Surface waves, *Acoustic delay lines, Lithium niobates, *Microwave acoustics.

The patent describes an acoustic surface wave delay line having a lithium niobate substrate member the surface wave propagation plane of which is parallel to the lithium niobate crystalline X axis and intersects the crystalline Z and -Y axes. Optimum results are obtained when the intersecting angle of the propagation plane and the Z axis is in the vicinity of 48.5 degrees.

PATENT-3 694 677/GA Not available NTIS
Office of the Secretary of the Army Washington D C
VHF-UHF PIEZOELECTRIC RESONATORS.
Patent,
Gunter K. Guttwein, Arthur D. Ballato, and Theodore J. Lukaszek. Filed 3 Mar 71, patented 26 Sep 72, 5p Rept nos. PAT-APPL-120 390,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Resonators, Piezoelectric crystals), (*Patents, Resonators), Very high frequency, Ultrahigh frequency, Resonant frequency.
Identifiers: PAT-CL-310-9-6.

The patent relates to crystals and particularly to very high frequency crystals. More particularly, this disclosure relates to techniques for increasing the fundamental resonant frequency of crystals beyond the limits of currently available mechanical techniques by reducing the thickness of a portion of the center of a standard crystal. This provides an effective resonant sector of an area and thickness that would be virtually impossible to manufacture or to mount by conventional techniques or use in existing mechanical structures.

PATENT-3 700 547/GA Not available NTIS
Office of the Secretary of the Army Washington D C
BONDING PROCESS FOR POLYPHENYLENE OXIDEDIELECTRIC MICROWAVE CIRCUITS AND BONDED ASSEMBLY.
Patent,
Homer E. Satterfield, Keith D. Stottlemyer, David L. Brown, and Leslie Roberts. Filed 20 Oct 70, patented 24 Oct 72, 5p Rept nos. PAT-APPL-82 251,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Strip transmission lines, *Patents), Bonding, Plastics, Dielectrics, Copper, Microwave equipment.
Identifiers: PAT-CL-161-213, Poly(oxy-phenylene), Ethylene copolymers, Acrylic acid copolymers.

The patent describes microwave striplines formed by intimately bonding circuit planes to polyphenylene oxide shield planes, heat and pressure is used in combination with an interface bonding material comprised of a polymeric resin composed of a random copolymer product of copolymerization of ethylene and acrylic acid.

PATENT-3 723 944/GA Not available NTIS
Department of the Navy Washington D C
QUICK-DISCONNECT ELECTRICAL CONNECTOR.
Patent,
Richard H. Gauchat, and Nathan W. Sabel. Filed 5 Mar 71, patented 27 Mar 73, 4p Rept nos. PAT-APPL-121 423,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Electric connectors, Disconnect fittings), (*Patents, Electric connectors).
Identifiers: PAT-CL-339-45-R.

The patent describes a quick-disconnect electrical connector having a tubular body with an outwardly extending tapered surface and a barrel having a plurality of resilient fingers surrounding said tapered surface. Cam means are provided for moving said barrel relative to said tubular body whereby said fingers are outwardly extended. A pair of electrical contacts are provided inside said tubular body for engaging with contacts in a mating connector.

PATENT-3 725 729/GA Not available NTIS
Office of the Secretary of the Army Washington D C
ELECTRICAL CROWBAR SYSTEM WITH NOVEL TRIGGERED SPARK GAP DEVICES.
Patent,
Michael S. McDermott, and Carl A. Pedersop. .
Filed 29 Oct 71, patented 3 Apr 73, 5p Rept nos. PAT-APPL-193 847,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Relays, *Patents), Electric discharges, Electrodes, Switching circuits.
Identifiers: PAT-CL-315-75, Spark gap services.

The patent describes spark gap devices which include removable and adjustable electrodes. The devices are usable in an electrical crowbar circuit. The devices include a master gap device and a slave gap device, each of which includes a tubular insular with metal end caps, and with electrodes attached to the end caps.

PATENT-3 725 856/GA Not available NTIS
Department of the Navy Washington D C
PUSH-PULL TRANSDUCER.
Patent,
John Chervenak. Filed 24 Sep 56, patented 3 Apr 73, 8p Rept nos. PAT-APPL-611 798,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Electroacoustic transducers, *Patents), Extremely low frequency.
Identifiers: PAT-CL-340-8-R.

The patent describes an electroacoustic transducer comprising an enclosing hollow piston element of relatively light rigid nonmagnetic material. A central vibratory mass element is situated within a piston element having opposite portions of magnetic material. The use of the piston-action vibrator unit eliminates complex modes of vibration, resulting in higher efficiency than ordinary diaphragm action.

PATENT-3 744 128/GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROCESS FOR MAKING RF SHIELDED CABLE CONNECTOR ASSEMBLIES AND THE PRODUCTS FORMED THEREBY.
Patent.
A. Fisher, and C. H. Clatterbuck. Patented 10 Jul 73, 7p NASA-CASE-GSC-11215-1,
Misc-Filed 12 Feb. 1971 Supersedes N72-10192 (10 - 01, p 0029).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Communication cables, *Connectors, *Radio frequency shielding, Electrical resistivity, Electronic equipment, Insulated structures, Patterns, Patents.

A process for making RF shielded cable connector assemblies and the resulting structures is described. The process basically consists of potting wires of a shielded cable between the cable shield and a connector housing to fill in, support, regidize, and insulate the individual wires contained in the cable. The formed potting is coated with an electrically conductive material so as to form an entirely encompassing adhering conductive path between the cable shield and the metallic connector housing. A protective jacket is thereby formed over the conductive coating between the cable shield and the connector housing.

SLA-73-462/GA PC$7.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
STUDY OF THE COMBINED EFFECTS OF IONIZATION, NEUTRONS, TEMPERATURE, AND TIME ON BIPOLAR DEVICES.
B. D. Shafer, D. H. Habing, and L. K. Horning. Apr 73, 99p

Descriptors: (*Transistors, *Physical radiation effects), Gain, Gamma radiation, Neutrons, Temperature dependence, Time dependence.

For abstract, see NSA 28 02, number 02763.

SLA-73-7/GA PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PRECISION GRAPHICS AT SANDIA LABORATORIES, ALBUQUERQUE, NEW MEXICO.
G. Carli, J. P. Brane, D. A. Oliver, and G. R. Urish. Feb 73, 50p

Descriptors: (*Integrated circuits, *Data processing), (*Digitizers, Data processing), Accuracy, Computers, Design, Specifications.

For abstract, see NSA 28 02, number 05070.

9B. Computers

AD-767 048/2GA PC$2.75/MF$1.45
George Washington Univ Washington D C Program in Logistics
ON THE USE OF APPROXIMATE QUEUING MODELS FOR MULTIPROGRAMMING COMPUTER SYSTEMS,
Carl M. Harris, and Thomas W. Johnson. 24 Aug 73, 18p Rept no. Serial-T-283
Contract N00014-67-A-0214-0001

Descriptors: (*Data processing systems, Multiple operation), (*Programming(Computers), Queueing theory), Input-output devices, Random variables, Mathematical models.
Identifiers: *Multiprogramming.

The note comments on some recent work by B. Avi-Itzhak and D. P. Heyman (1), which deals with the use of approximate queuing models for analyzing the behavior of multiprogramming computer systems. The intention of this work is to point out the implications of such an approach, to present an alternative model, and to discuss the procedures used to verify their approximation model. (Author)

AD-767 069/8GA
Mag Tape $300.00;Foreign $375.00
Mathematics and Computation Lab (Oep) Mclean Va
TELECONFERENCING NETWORKS,
Murray Turoff, and Rodney Renner. May 73, 2400 Ft* Rept no. MCL-TM-225 (Tape)
Availability: Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Communication systems, Management engineering), (*Social communication, *Data processing systems), Magnetic tape, Telephone communication systems.
Identifiers: UNIVAC 1108 computers, *Teleconferencing, Management information systems, Data processing terminals, On line systems, Delphi technique.

The system represents three methods of group communication using computer terminal as the vehicle for conducting a group discussion. The system that provides these methods was developed by OEP for a UNIVAC 1108 as a convenient form of communication among geographically dispersed individuals and/or as an adjunct to oral communications. Completely normal language is used. Use of the computer permits maintaining a written record automatically and allowing discussions in which participants need not talk and listen in synchronism (in contrast to conventional meetings and telephone conference calls). In two of the methods, the discussants need not even be participating simultaneously. Several other useful features are offered in order to facilitate group solution to problems when that is the conference objective. The system is simple to use and is relatively inexpensive for groups that already possess the necessary computer time-sharing facilities. The methods are 'Party-Line', 'Discussion', 'Conference'. Any of these conference systems may be used in a DELPHI (anonymous) mode by having users specify code names instead of real names. (Modified author abstract)

AD-767 071/4GA PC$2.75/MF$1.45
University of Southern California Los Angeles Dept of Industrial and Systems Engineering
COST TRADEOFFS BETWEEN LOCAL AND REMOTE COMPUTING.
Technical rept.,
Bennet P. Lientz. 25 Aug 73, 19p Rept no. TR-4
Contract N00014-67-A-0269-0027

Descriptors: (*Data processing systems, Cost effectiveness), Networks, Traffic, Design, Optimization, Statistical analysis, Remote control systems.
Identifiers: *Computer networks, Management information systems, Data bases, Benefit cost analysis.

A major problem in communication networks analysis is to determine the degree of centralization of computer power that is desirable from both an operational and cost/benefit point of view. An example of this problem occurs in a manufacturing complex wherein decisions must be made on the distribution of data, process power, and redundancy. Because of the many parameters involving hardware, system software, and communications, a purely analytical approach is often impractical. The method here is to employ an analytical simulation model to obtain measures of cost, throughout, and response time. After the mode itself is examined, focus is placed on several experiments which reveal the superiority of semi-centralized configurations. Application to logistic and manufacturing systems are explored along with the development of a network link construction method. The above mentioned experiments reveal the dependence of the analysis on the characteristics of the actual or anticipated message traffic. For a manufacturing system, a method is developed for isolating parts of a computer network as a specific degree of importance to the network functioning and failing. This is examined in the context of the message traffic rather than graph theoretic methods. More specifically, in a manufacturing environment the importance of hardware, management information systems, and data bases to the functioning of a computer network system is considered. (Modified author abstract)

AD-767 080/5GA PC$3.00/MF$1.45
Maryland Univ College Park Computer Science Center
TWO HEADS ARE BETTER THAN ONE.
Technical rept.,
Anupam N. Shah, and Azriel Rosenfeld. Sep 73, 13p Rept no. TR-261
Contract N00014-67-A-0239-0012

Descriptors: (*Programming(Computers), *Mathematical logic), Automata, Set theory, Theorems.
Identifiers: *Automata theory, Finite state machines, Turing machines, Image Processing.

A class of multihead read-only automata, that operate synchronously on a single tape, is defined. It is shown that an n-head automation can imitate an automation that has n-1 pebbles. Deterministic two-head automata are described that accept the languages (a sup n)/(b sup n) (or, more generally, the strings on (a,b) having the same number of a's as b's; and similarly for (a sup n)(b sup n)(c sup n), etc.); omega omega; omega(omega sup R); and a(sup(K sup n)), for any fixed k. (Author)

AD-767 213/2GA PC$3.75/MF$1.45
Clarkson Coll of Technology Potsdam N Y
FAULT-DETECTION EXPERIMENTS ON STRUCTURALLY DECOMPOSABLE SEQUENTIAL MACHINES.
Interim rept.,
Purnendu Das, and Daniel E. Farmer. Jul 73, 99p
RADC-TR-73-216
Contract F30602-72-C-0463

Descriptors: (*Digital computers, Reliability(Electronics)), (*Logic Circuits, Test methods), Gates(Circuits), Switching circuits, Input-output devices, Malfunctions, Algorithms, Theorems, Programming(Computers), Computer logic.
Identifiers: *Sequential machines, *Fault detection, Fault tolerant computing, Automata theory, Switching theory.

The report treats the problem of devising fault-detection experiments for sequential machines having their decompositions known. In these experi-

ments inputs are applied at the input terminals of the machine and the outputs observed at the output terminals, and no intermediate terminal is accessible. The output at any intermediate terminal is assumed known only for the design of the test but is never used in the actual experiment. The problem is treated from the standpoint of machine identification, with a possible faulty machine being identified as either isomorphic to its fault-free counterpart or not isomorphic to it. A test for a component machine is designed such that all the states of the component are identified and also sufficient non-elementary transitions are identified for unique representation of the machine. (Modified author abstract)

AD-767 216/5GA PC$4.75/MF$1.45
Rand Corp Santa Monica Calif
THE SIMSCRIPT II PROGRAMMING LANGUAGE: IBM 360 IMPLEMENTATION,
P. J. Kiviat, D. W. Kosy, H. J. Shukiar, J. B. Urman, and R. Villanueva. Mar 72, 54p Rept no. RM-5777-1-PR
Contract F44620-67-C-0045
Supersedes report dated Jul 69, AD-692 695. See also report dated Oct 68, AD-678 690 and report dated Oct 68, AD-678 867.

Descriptors: (*Programming languages, Instruction manuals), Compilers, Computer programs, Control sequences, Errors.
Identifiers: *SIMSCRIPT 2 programming language, *IBM 360/65 computers.

The report contains information on the implementation of the SIMSCRIPT 2 computer language on Rand's IBM 360 Model 65 computer system. It should be of general interest to IBM 360 users, and to persons undertaking the task of implementing SIMSCRIPT 2 on other computers. Both the implementation of this report have been revised to eliminate errors discovered since the report was first released (July 1969) and to bring out a few new features.

AD-767 261/1GA PC$5.75/MF$1.45
System Development Corp Santa Monica Calif
APPLICATION OF ASSOCIATIVE PROCESSING TO REAL-TIME DATA MANAGEMENT FUNCTIONS.
Final technical rept. 2 Nov 71-1 Nov 72,
Richard R. Linda, Roy Gates, and Te-Fu Peng. Jun 73, 240p* RADC-TR-73-169
Contract F30602-72-C-0112

Descriptors: (*Data processing systems, Real time), Air traffic control systems, Tactical warfare, Data storage systems, Programming(Computers), Cost effectiveness, Performance(Engineering).
Identifiers: Data management systems, *Associative processors, TACC(Tactical Air Control Center), Tactical Air Command Center, Data structures, Associative storage.

The report describes the results of an analytic investigation and comparison of associative processing techniques against conventional sequential processing techniques for real time data management functions. As a basis for the investigation, a hypothetical Associative Processor Computer System (APCS), a set of data management system subfunctions, an analysis of the Air Force Tactical Air Control Center (TACC) as viewed from a Current Operations testbed, and a set of comparison features were developed. The APCS consists of an associative processor containing two processing units of 2048 words (256 bits/word) each, linked to a sequential processor. A set of generic data management functions is described, along with data management subfunctions that may be programmed on the APCS using a relational data structure. Three TACC testbed analysis functions were programmed for the APCS and for the testbed IBM 1800, with the performance of both systems being normalized to the same basic technology. Measurements showing APCS performance subfunctions (retrieval and update) are presented; an initial APCS performance improvement of 3:1 with respect to the TACC functions is shown. (Modified author abstract)

AD-767 271/0GA PC$2.75/MF$1.45
General Electric Corporate Research and Development Schenectady N Y
DESIGN, FABRICATION, AND EVALUATION OF AN ELECTRON BEAM ADDRESSABLE HIGH INFORMATION DENSITY MEMORY TUBE.
Quarterly progress rept. no. 5, 1 Mar-30 Apr 73,
Charles Q. Lemmond. Sep 73, 21p Rept no. SRD-73-115 ECOM-0098-5-72
Contract DAAB07-72-C-0098
See also report dated Jun 73, AD-763 220.

Descriptors: (*Computer storage devices, *Storage tubes), (*Data storage systems, Design), Electron optics, Lenses, Electron beams, Electron guns, Electron tube targets, Reliability(Electronics).
Identifiers: BORAM(Block Oriented Random Access Memories), Block oriented random access memories, Random access computer storage.

The technical objective of this development program is the design fabrication, and evaluation of an experimental model electron beam addressable, high information density memory tube. The tube is to be a sealed-off, self-contained unit consisting of an electron source, the necessary electron optics for performing the required write and read functions, and a storage structure containing approximately 10 million elements. The program is directed towards the development of an economically feasible electron beam addressable, high information density memory tube. This operational tube shall serve as the storage element section of a block-oriented random access memory (BORAM). During this reporting period static tests were conducted on two complete memory tubes. Target studies and manufacturing improvements continue. Debugging and testing of the General Electric's memory test system continues. Final debugging will require a complete, operable memory tube to test the read-out electronics.

AD-767 273/6GA PC$3.50/MF$1.45
Adaptronics Inc Mclean Va
THE MUCCIARDI-GOSE CLUSTERING ALGORITHM AND ITS APPLICATIONS IN AUTOMATIC PATTERN RECOGNITION.
Final rept. 15 Mar-15 Nov 72,
Anthony N. Mucciardi. Jul 73, 75p Rept no. 662-FTR AMRL-TR-73-31
Contract F33615-72-C-1491

Descriptors: (*Pattern recognition, Algorithms), Multivariate analysis, Probability density functions, Programming(Computers), Aerial reconnaissance, Pictures, Mathematical models.
Identifiers: CLUSTR Computer program, PDP-12 computers, CDC 6600 computers, Clustering.

A procedure known as the Mucciardi-Gose clustering algorithm, CLUSTR, for determining the geometrical or statistical relationships among groups of N-dimensional vectors is presented. The vectors may be thought of as samples from some complex process that is under study. For example, the process may be aerial reconnaissance photography, and the vectors may be digital representations of the pictures. In this example, the geometrical or statistical relationships between the pictures, some part of the pictures, or some derivative of the pictures, must be known before an automatic analysis of the content of the pictures can be performed by machine. The CLUSTR algorithm provides a means of determining these relationships. A general discussion of clustering algorithms is given; the particular advantages of the Mucciardi-Gose procedure are described. The mathematical basis for, and the program structure of, the CLUSTR algorithm are presented in detail. Topics covered include: initial cluster hypervolume estimates, birth and growth rate processes of clusters, estimation of cluster hypervolume overlap. Specific instructions for use of the programs and for interpretation of the results are provided. (Author)

AD-767 327/0GA PC$8.25/MF$1.45
Naval Postgraduate School Monterey Calif
ALL APPLICATION DIGITAL COMPUTER: COURSE NOTES.
Technical rept. 1972-1973,
Gordon H. Syms. Mar 73, 420p Rept no. NPS-53ZZ73031A

Descriptors: (*Special purpose computers, Naval aircraft), State-of-the-art reviews, Digital computers, Thin film storage devices, Programming languages, Programming(Computers), Design, Real time, Time sharing, Symposia.
Identifiers: AADC(All Application Digital Computer), All application digital computer, Advanced avionic digital computer, Avionics, Airborne computers, Modular computers, Magnetic film memories, Multiprocessing, Random access computer storage, BORAM(Block Oriented Random Access Memories), Block oriented random access memories.

The report is a set of course notes, or text, on the proposed Navy All Application Digital Computer. The AADC, as it is called, is a programmer-oriented, general purpose, modular digital computer that was originally designed to meet all the 1975-1985 Naval airborne data processing requirements, but it has now had its role generalized to include 'All Applications.' Since the AADC combines many of the most advanced computer hardware concepts now under development in the United States, the study of AADC should be of general interest. The all application role includes real-time and time-sharing computations, and special applications such as line concentrators, super modems, data channels and aircraft electric power controllers. This report includes a chapter on each of the following: a general introduction and summary of all chapters, AADC architectures, all application role, hardware technology, Data Processor Element, Master Executive Control, Signal Processing Element, evaluating AADC developments, High Order Language, and AADC applications. (Modified author abstract)

AD-767 330/4GA PC$3.50/MF$1.45
Arizona Univ Tucson Dept of Aerospace and Mechanical Engineering
A GRAPHICS ORIENTED INTERACTIVE FINITE ELEMENT TIME SHARING PACKAGE (GIFTS),
H. A. Kamel, and M. W. McCabe. 25 Jul 73, 72p
Contract N00014-67-A-0209-0016

Descriptors: (*Structural properties, *Programming(Computers)), (*Ships, Design), Data processing systems, Time sharing, Graphics, Matrix algebra, Curve fitting.
Identifiers: Finite element analysis, GIFTS system, Naval architecture, Structural analysis, Interactive computer programs, Stiffness methods.

The report describes a general purpose analysis package (GIFTS) (Graphics oriented Integrated Finite element Time Sharing package) aimed primarily at ship structure design using the finite element method on a time-sharing system. Although the project was started with ship structures in mind, the concept has developed in such a manner as to offer a solution to other problems related to finite element analysis. The end product should provide a nationwide communication system between users enabling them to exchange data, results and programs with relative ease. The system acknowledges and uses some of the latest developments in computer technology, namely, time-sharing, inexpensive graphics terminals, and computer networks. It also may be used advantageously with mini-computers.

AD-767 331/2GA PC$3.50/MF$1.45
Stanford Univ Calif Dept of Computer Science
AUTOMATIC PROGRAM VERIFICATION I: A LOGICAL BASIS AND ITS IMPLEMENTATION,
Shigeru Igarashi, Ralph L. London, and David C. Luckham. May 73, 55p Rept nos. STAN-CS-73-365, AIM-200
Contracts DAHC15-72-C-0308, SD-183
Sponsored in part by Contract NSR-05-020-500. Report on Stanford Artificial Intelligence Project. Also available as rept. no. ISI/RR-73-11.

Descriptors: (*Programming(Computers), Mathematical logic), (*Programming languages, Semantics), Compilers, Specifications.
Identifiers: Axioms, Boolean algebra, ALGOL.

Defining the semantics of programming languages by axioms and rules of inference yields a deduction system within which proofs may be given that programs satisfy specifications. The deduction system herein is shown to be consistent and also deductive complete with respect to Hoare's system. A subgoaler for the deductive system is described whose input is a significant subset of Pascal Programs plus inductive assertions. The output is a set of verification conditions or lemmas to be proved. Several non-trivial arithmetic and sorting programs have been shown to satisfy specifications by using an interactive theorem prover to automatically generate proofs of the verification conditions. Additional components for a more powerful verification system are under construction. (Author)

AD-767 332/0GA PC$3.50/MF$1.45
Stanford Univ Calif Dept of Computer Science
A CORNER FINDER FOR VISUAL FEEDBACK,
W. A. Perkins, and T. O. Binford. Aug 73, 63p
Rept nos. STAN-CS-73-386, AIM-214
Contract SD-183, ARPA Order-457
Report on Stanford Artificial Intelligence Project.

Descriptors: (*Programming(Computers), Pattern recognition), (*Pattern recognition, Pictures), Visual perception, Feedback, Image intensifiers(Electronics), Television equipment, Information theory, Graphics, Digital systems.
Identifiers: Edge detection, ALGOL.

In visual-feedback work often a model of an object and its approximate location are known and it is only necessary to determine its location and orientation more accurately. The purpose of the program described herein is to provide such information for the case in which the model is an edge or corner. Given a model of a line or a corner with two or three edges, the program searches a TV window of arbitrary size looking for one or all corners which match the model. A model-driven program directs the search. It calls on another program to find all lines inside the window. Then it looks at these lines and eliminates lines which cannot match any of the model lines. It next calls on a program to form vertices and then checks for a matching vertex. If this simple procedure fails, the model-driver has two backup procedures. First it works with the lines that it has and tries to form a matching vertex (corner). If this fails, it matches parts of the model with vertices and lines that are present and then takes a careful look in a small region in which it expects to find a missing line. The program often finds weak contrast edges in this manner. Lines are found by a global method after the entire window has been scanned with the Hueckel edge operator. (Author)

AD-767 335/3GA PC$3.00/MF$1.45
Stanford Univ Calif Dept of Computer Science
AXIOMATIC APPROACH TO TOTAL CORRECTNESS OF PROGRAMS,
Zohar Manna, and Amir Pnueli. Jul 73, 28p Rept nos. STAN-CS-73-382, AIM-210
Contracts DAHC15-73-C-0435, SD-183
Report on Stanford Artificial Intelligence Project. Prepared in cooperation with Weizmann Inst. of Science, Rehovot (Israel). Dept. of Applied Mathematics.

Descriptors: (*Programming(Computers), *Mathematical logic), Inequalities, Mapping(Transformations).
Identifiers: Axioms, ALGOL.

The authors present an axiomatic approach which enables one to prove by formal methods that his program is totally correct (i.e., it terminates and is logically correct -- does what it is supposed to do). The approach is similar to Hoare's approach for proving that a program is partially correct (i.e., that whenever it terminates it produces correct results). The extension to Hoare's method lies in the possibility of proving correctness and termination at once, and in the enlarged scope of properties that can be proved by it. (Author)

AD-767 375/9GA PC$3.00/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
DISCRETE VARIATE GENERATION.
Technical rept.,
George S. Fishman. Sep 73, 36p Rept no. TR-28-4
Contract N00014-67-A-0097-0028

Descriptors: (*Statistical distributions, *Programming(Computers)), Digital computers, Transformations, Approximation(Mathematics), Compilers, Random variables.
Identifiers: Computerized simulation, *Binomial density functions, SIMSCRIPT 2 programming language, Computation, IBM 370/155 computers, Multiprogramming.

The paper examines alternative techniques for generating random variables from the Poisson, geometric, negative binomial and binomial distributions on a digital computer. A fourfold criterion is used to evaluate these techniques. The criterion is based on the CPU time needed to generate a variate, the sensitivity of this time to changing parameter values, numerical roundoff error and extent to which cost-saving distributional approximations can be used. One conclusion of the study is that in many cases the inverse transformation method appears more attractive than alternative techniques specific to particular distributions. (Author)

AD-767 403/9GA PC$12.00/MF$1.45
Network Analysis Corp Glen Cove N Y
THE PRACTICAL IMPACT OF THE RECENT COMPUTER ADVANCES ON THE ANALYSIS AND DESIGN OF LARGE SCALE NETWORKS.
Semiannual rept. no. 1,
Howard Frank. May 73, 198p
Contract DAHC15-73-C-0135, ARPA Order-2286

Descriptors: (*Data processing systems, Networks), Data transmission systems, Optimization, Reliability, Costs, Performance(Engineering), Algorithms.
Identifiers: *Computer networks, ARPA computer network, Network analysis theory, ILLIAC, ILLIAC 4 computer.

New research results on the following major questions are reported: Growth and cost performance tradeoffs for the ARPANET, traffic sensitivity analyses with measured traffic and with possible ILLIAC IV traffic effects and ARPANET capacity expansion. Initial cost, delay, throughput and reliability analyses for a 1000 node packet switched network based on ARPANET technology. Development of efficient algorithms for location and line layout for local and regional access to Terminal Interface Processors. The development of an interactive data handling system based on an IMLAC display and distributed ARPANET computation. Study of flow control, routing and time delay and system organization for broadcast packet systems. (Author)

AD-767 420/3GA PC$16.75/MF$1.45
Information Systems Menlo Park Calif
ANTENNA MODELING PROGRAM - SYSTEMS MANUAL.
10 Apr 73, 291p Rept no. IS-R-72/10
Contract N00014-71-C-0187

Descriptors: (*Antenna arrays, Computer programs), (*Computer programs, Instruction manuals), Antenna radiation patterns, Gain, Subroutines, Mathematical models, Matrix algebra, Integral equations, Polarization.
Identifiers: FORTRAN, AMP computer program, Thin wire antennas.

The manual contains a detailed discussion of the FORTRAN coding of the Antenna Modeling Program (AMP). Its purpose is to aid the programmer in understanding the intricacies of the Fortran coding, and it is designed as a reference manual so that the programmer can examine the function of one subroutine or common block separately. By the same token the FORTRAN list is an integral part of the manual and should be used in conjunction iwth reference to the manual. The Antenna Modeling Program is based on the thin wire electric field integral equation which relates the exciting electric field to the induced currents on some specified thin wire geometry. The integral equation is reduced to an N dimensional system of linear equations by representing the current in terms of N sinusoidal basis functions and enforcing the integral equation at N discrete points.

AD-767 438/5GA PC$3.00/MF$1.45
Institute for the Future Menlo Park Calif
ARPA POLICY-FORMULATION INTERROGATION NETWORK.
Semiannual technical rept. 6 Mar-6 Sep 73,
Jacques Vallee, Robert Johansen, Hubert M. Lipinski, and Richard H. Miller. 15 Sep 73, 41p
Rept no. SR-30
Contract DAHC15-72-C-0165, ARPA Order-2005

Descriptors: (*Social communication, *Data processing systems), (*Communication systems, Management engineering), (*Programming(Computers), Instruction manuals), Networks, Decision making, Real time.
Identifiers: *Teleconferencing, Management information systems, Computer networks PDP-10 computers, FORUM computer program.

The report describes progress made in the development of network-oriented system for teleconferencing. The program is called FORUM. Most of the preliminary software tests have now been completed. The current version (Release 4) follows the specifications given in the previous semiannual report, of which the general systems features of the Programmer's, Chairman's, and Respondent's Guides are still applicable. The present document addresses itself more specifically to a review of practical experience in the use of FORUM both at the Institute and within the ARPANET community. It is divided into three sections describing: (1) the current program status; (2) user experience to date; and (3) implementation plans beyond Release 4. An analysis of user reaction at USC-ISE is described in the second section of the report, with background data as a special appendix to the report. (Author)

AD-767 460/9GA Reprint
Maryland Univ College Park Dept of Electrical Engineering
A HEURISTIC METHOD FOR FINDING MOST EXTREMA OF A NONLINEAR FUNCTIONAL,
Jasna Opacic. 28 Jul 72, 7p AFOSR-TR-73-1706
Grant AF-AFOSR-1910-70
Revision of report dated 13 Dec 71.
Availability: Pub. in IEEE Transactions on Systems, Man and Cybernetics, vSMC-3 n1 p102-107 Jan 73.

Descriptors: (*Search theory, Optimization), Mathematical logic, Graphics, Algorithms.
Identifiers: Heuristic methods, Trees(Mathematics), Automata theory.

Analytical solutions are not readily available, and some kind of global strategy is required for nonlinear optimization problems with multimodal per-

formance functions. A group of random techniques, which may be described as systematic unguided random searches, uses as the global strategy the elimination of unwanted regions, so as to locate the region in which the global minimum lies. For this, the parameter space is quantized into cells. Despite the fact that these methods can use adaptive learning to improve their performance, the major remaining obstacle to this approach is the 'curse of dimensionality' (Bellman). In higher dimensions this also affects the pure random search, which does not need to divide the space into cells. To circumvent some of the difficulties a different kind of approach is proposed. The method which is used here does not eliminate unwanted regions, nor does it make any particular assumptions about a surface. The strategy is based on a repetitive implementation of heuristic rules and on subsequent evaluations of the results obtained.

AD-767 503/6GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
META S: A METALANGUAGE FOR COMPILERS,
W. J. Chandler. 1973, 6p AFOSR-TR-73-1746
Contract F44620-71-C-0067
Availability: Pub. in Proceedings of the Hawaii International Conference on System Sciences, held in Honolulu on 9-11 Jan 73, p101-103.

Descriptors: (*Programming languages, Syntax), Compilers.
Identifiers: META S programming language.

A metalanguage for efficient description of one-pass compilers is presented. Its input is the conventional form of BNF productions with interlaced actions and tests. META S differs from other metalanguages by its pre-defined data structures, arithmetic capability, and symbol table with arbitrary attributes. (Author)

AD-767 603/4GA PC$2.75/MF$1.45
Synectics Corp Allison Park Pa
REVIEW AND EVALUATION OF ADVANCED BEHAVIORAL SCIENCE TECHNIQUES FOR INDICATIONS AND WARNING APPLICATIONS.
Technical rept.,
James W. Altman. May 73, 24p Rept no. 487-C-1
RADC-TR-73-278
Contract F30602-73-C-0052, ARPA Order-2229

Descriptors: (*Data processing systems, Military intelligence), Information retrieval, Political science, Management planning.
Identifiers: *Management information systems, Cambridge project, Diana project, International relations.

The essential purpose of this project is to exploit techniques developed under The Cambridge Project: Computer Methods for Analysis and Modeling of Complex Systems and by the Center for Computer-Based Behavioral Studies (CCBS) for demonstrated aid to performance in the Indications and Warning (I and W) area of military intelligence. The Technical Report summarizes progress during the half year beginning in October of 1972. (Modified author abstract)

AD-767 604/2GA PC$4.75/MF$1.45
Georgia Univ Athens Dept of Statistics and Computer Science
AN INTERACTIVE ANALYSIS OF COVARIANCE UNIT.
Technical rept.,
Mary E. Nash, and Rolf E. Bargmann. Jul 73, 169p
Rept nos. TR-95, THEMIS-UGA-25
Contract N00014-69-A-0423

Descriptors: (*Programming(Computers), *Analysis of variance), Computer programs, Regression analysis, Statistical analysis, Instruction manuals.
Identifiers: IBM 360/65 computers, *Covariance, Themis project, Computer graphics, FORTRAN.

The report contains description and program documentations of a conversational unit for analysis of covariance of data in regular or irregular two-way classification designs. The main part of this report on the basis of detailed illustrations. It describes the question-and-answer frames on a Graphics (IBM 2250) console. The user need not be familiar with programming or with computational details of analysis of covariance. He receives instructions for description of his data from graphically displayed questions. First, an analysis of variance is performed on the response variable. Means, adjusted means, and the analysis of variance table are reported. The user may edit data or see the data plotted before continuing the analysis. After the analysis of covariance, means and adjusted means of the response residuals are reported. The error matrix, correlations matrix, partial regression coefficients, and the analysis of covariance table are displayed. Again, the user may edit data or see plots (now including a regression line or curve). He may perform a new analysis of covariance for various subsets of the concomitant variables. Listings of the FORTRAN programs are contained in the appendix. (Author)

AD-767 607/5GA PC$5.25/MF$1.45
Boston Coll Chestnut Hill Mass Space Data Analysis Lab
NUMERICAL AND DATA ANALYSIS TECHNIQUES APPLIED TO SCIENTIFIC RESEARCH.
Final rept. 1 Jan 70-31 Dec 72,
Joseph E. Martine, and Leo F. Power, Jr. 31 Jan 73, 189p* AFCRL-TR-73-0433
Contract F19628-70-C-0120

Descriptors: (*Programming(Computers), *Numerical analysis), Integral equations, Fourier analysis, Exponential functions, Curve fitting, Partial differential equations, Physics, Chemistry, Scientific research.
Identifiers: Numerical integration, *Applications of mathematics.

The purpose of the report is to describe some selected data analysis, numerical analysis and computer programming problems performed under the contract. The problems range from a new method for evaluating integral equations where the integrand is not well behaved to a detailed study of the techniques of exponential curve fitting. Also included are some problems requiring straight-forward data analysis. Each problem selected is presented in capsule form and the analysis and programming techniques leading to a solution are outlined. It should be noted that some of these problems are still being analyzed because of their complexity and continuing character. (Author)

AECL-4433/GA PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
EPOC: SUCCESS I ENGINEERING PACKAGE EXECUTIVE PROGRAM.
P. D. Erickson. Jan 73, 19p
U.S. Sales Only.

Descriptors: (*Data acquisition, Computer codes), (*Computer codes, *E codes), Real time systems.

For abstract, see NSA 28 02, number 04973.

AEEW-R-822/GA PC$4.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
SYNCON: GENERAL SYNTAX CONVERSION LANGUAGE AND COMPUTER PROGRAM.
D. C. Bindon. Sep 72, 52p
U.S. Sales Only.

Descriptors: (*Computers, *Programming languages), Programming.

For abstract, see NSA 28 03, number 07625.

AERE-R-6432/GA PC$4.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
PAPERS ON REAL-TIME PROGRAMMING.
I. C. Pyle. Jul 70, 40p CONF-700678-
U.S. Sales Only.

Descriptors: (*Real time systems, *Programming), (*Computers, Programming), Camac system, Meetings, On-line systems, Programming languages.

For abstract, see NSA 28 02, number 04975.

ANCR-1099/GA PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
NRTS OS/360 CALCOMP PLOT WRITER.
L. C. Richardson, and A. J. Smith. Mar 73, 55p
Contract AT(10-1)-1375

Descriptors: (*Computers, *Manuals), Diagrams, Nrts.

For abstract, see NSA 28 02, number 04976.

BNL-17747/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
BNL HARDWARE MONITOR.
A. M. Peskin. 1972, 19p CONF-730522-2

Descriptors: (*Computers, *Monitoring), Electronic equipment.

For abstract, see NSA 28 03, number 07627.

BNWL-1743/GA PC$5.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
EVALUATION OF FOUR PSEUDO-RANDOM NUMBER GENERATORS.
R. O. Gilbert. May 73, 61p
Contract AT(45-1)-1830

Descriptors: Computer codes, Distribution, Mathematics.

For abstract, see NSA 28 03, number 07666.

COM-73-50750/1GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Information Processing Technology Div.
ANNOTATED BIBLIOGRAPHY OF THE LITERATURE ON RESOURCE SHARING COMPUTER NETWORKS,
Quarterly rept. no. 4.
Robert P. Blanc, Ira W. Cotton, Thomas N. Pyke, Jr., and Shirley W. Watkins. Sep 73, 97p NBS-SP-384
Grant NSF-AG-350
Paper copy available from GPO $1.25 as C13.10:384.

Descriptors: (*Computers, *Bibliographies), Data processing, Data transmission, Networks, Information systems, Management systems.
Identifiers: *Computer networks, Management information systems.

The bibliography consists of references with critical annotations to the literature on computer networks. A classification scheme has been developed to place each annotation in a category reflective of its content. Five indexes to the bibliography are included: author index, corporate author index, network index, key word out of context index, and report number index.

CONF-730419-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ENGINEERING TEST AND CONTROL COMPUTERS.
R. K. Adams, and M. B. Herskovitz. 1973, 5p

Descriptors: (*Reactors, *Temperature measurement), (*Computers, *Control systems), Performance, Testing, Uses.

For abstract, see NSA 28 03, number 07628.

CONF-730522-3/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
COMPUTER SYSTEM PERFORMANCE MONITORING AT ORNL.
J. G. Sullivan. (nd). 4p

Descriptors: (*Pdp computers, *Performance), (*Ibm computers, Performance), Control, Ornl.

For abstract, see NSA 28 03, number 07629.

COO-1469-218/GA PC$9.00/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
QUARTERLY TECHNICAL PROGRESS REPORT, OCTOBER--DECEMBER 1972.
W. J. Poppelbaum. 1972, 137p COO-2118-44, UIUCDCS-QPR-72-4

Descriptors: (*Computers, *Research programs), Digital systems, Electronic circuits, Image converters, Programming, Switching circuits.

For abstract, see NSA 28 02, number 04977.

COO-1469-222/GA PC$3.25/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
RECORD OF ACHIEVEMENTS AND PLANS OF THE INFORMATION ENGINEERING LABORATORY.
W. J. Poppelbaum. Mar 73, 24p UIUCDCS-R-73-568
Contract AT(11-1)-1469

Descriptors: (*Computers, Information systems), (*Information systems, *Research programs), Data processing, Display devices, Interactive display devices, On-line systems, Reviews, Stochastic processes.

For abstract, see NSA 28 02, number 04980.

COO-3130-TB-167/GA PC$3.00/MF$1.45
Brown Univ., Providence, R. I. Dept. Of Physics.
SPEX (SPECTROMETER EXECUTIVE): GENERAL STRUCTURE.
J. T. Massimo, B. A. Nelson, and L. J. Levinson. Aug 72, 18p
Contract AT(11-1)-3130-TB

Descriptors: (*Computer codes, S codes), (*S codes, *Data acquisition systems), (*Spectrometers, Data acquisition systems), Data processing.

For abstract, see NSA 28 03, number 05731.

CTC-INF-1046/GA PC$3.00/MF$1.45
Union Carbide Corp., Oak Ridge, Tenn. Computing Technology Center.
ENHANCING SOFTWARE RELIABILITY THROUGH DOCUMENTATION.
C. E. Price. 1973, 16p CONF-730424-1
Contract W-7405-eng-26

Descriptors: (*Computers, *Reliability), Computer codes, Documentation.

For abstract, see NSA 28 03, number 07631.

EUR-4940/GA PC$4.25/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
CADI: A COMPUTER CODE FOR SYSTEM AVAILABILITY AND RELIABILITY EVALUATION.
A. G. Colombo. Apr 73, 43p
U.S. Sales Only.

Descriptors: (*Computer codes, *C codes), (*Computers, *Reliability), Availability, Fault tree analysis.

For abstract, see NSA 28 02, number 04981.

GEPP-102/GA PC$3.00/MF$1.45
General Electric CO., St. Petersburg, Fla. Neutron Devices Dept.
INTERFACE FOR HAZELTINE 2000 CRT TERMINAL AND INTERDATA MINICOMPUTERS.
J. F. Howell. 25 May 73, 5p
Contract AT(29-2)-656

Descriptors: (*Computers, *Electronic equipment), Data processing.

For abstract, see NSA 28 03, number 07633.

HEDL-TME-7260/GA PC$5.45/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
PLUTONIUM FUELS LABORATORY DATA ACQUISITION SYSTEM OPERATING PROCEDURES.
W. R. Markillie, and V. L. Crow. 58p
Contract AT(45-1)-2170

Descriptors: (*Data acquisition systems, *Operation), Computer calculations, Hapo, Nuclear fuels, Plutonium.

For abstract, see NSA 28 03, number 05824.

HMI-B-130/GA PC$4.00/MF$1.45
Hahn-Meitner-Institut fuer Kernforschung, Berlin (West Germany).
RESULTS OF A FORTRAN BENCHMARK CONDUCTED ON FIVE LARGE SCALE COMPUTER SYSTEMS RUNNING IN BATCH MODE.
K. P. Beier. Jan 73, 37p
In German. U.S. Sales Only.

Descriptors: (*Cdc computers, *Fortran), (*Ibm computers, Fortran), (*Pdp computers, Fortran), (*Computers, Fortran), Data.

For abstract, see NSA 28 03, number 07634.

JINR-P10-7061/GA PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
PROGRAMS FOR PRELIMINARY PROCESSING OF SPECTROMETRICAL INFORMATION ON THE COMPUTER "MINSK-2" USING DISPLAY.
L. Vylova, M. Potempa, V. I. Fominykh, M. I. Fominykh, and V. M. Tsupko-Sitnikov. 1973, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Spectroscopy, *Data processing), Besm computers, Minsk computers.

For abstract, see NSA 28 03, number 05732.

JINR-P11-7005/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
BINARY-TO-DECIMAL CONVERTER PERFORMED IN CAMAC SYSTEM.
I. F. Kolpakov, N. M. Nikityuk, and L. A. Urmanova. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: Camac system, Computers, Counting circuits, Scalers.

For abstract, see NSA 28 03, number 05825.

JUL-CONF-7/GA PC$13.00/MF$1.45
Kernforschungsanlage, Juelich (West Germany).
INFORMATION CONFERENCE DATA PROCESSING IN RESEARCH, JULICH, GERMANY, 12--13 OCTOBER 1972.
H. W. Meuer. Oct 72, 218p CONF-721083-
In German and English. U.S. Sales Only.

Descriptors: (*Data processing, *Meetings), Information, Leading abstract, Research programs.

For abstract, see NSA 28 03, number 07618.

KFK-EXT-13/72-4/GA PC$6.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Datenverarbeitung in der Technik.
PROGRAM DESCRIPTION OF THE SIMULATION SYSTEM PLIM.
G. Fleck, M. Rupp, J. Nehmer, R. Friehmelt, and D. Hilse. Jan 73, 80p
In German. U.S. Sales Only.

Descriptors: (*Computer codes, *P codes), (*Computers, *Simulators).

For abstract, see NSA 28 02, number 04983.

KFK-1752/GA PC$3.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Labor fuer Elektronik und Messtechnik.
CAMAC PULSE GENERATOR LEM-52/13.1.
G. Dietzel, and P. M. Fischer. Feb 73, 25p
In German. U.S. Sales Only.

Descriptors: (*Pulse generators, *Specifications), Camac system, Computers, Control systems.

For abstract, see NSA 28 02, number 02770.

LA-UR-73-150/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
GRAPHICS AND ENGINEERING.
L. H. Jr. Baker, and E. K. Tucker. 1973, 9p CONF-730604-1

Descriptors: Computers, Data display systems, Photography.

For abstract, see NSA 28 03, number 07636.

LA-UR-73-483/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
MINICOMPUTER APPLICATIONS AT LAMPF.
R. A. Gore, and D. R. Machen. 1973, 7p CONF-730508-3

Descriptors: (*Lampf linac, *Control systems), Beam monitoring, Computers, Data acquisition systems, Uses.

For abstract, see NSA 28 03, number 06481.

LA-5144/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DESIGN AND OPERATION OF A MICROPROGRAMMED BRANCH DRIVER FOR A PDP-11 COMPUTER.
L. R. Biswell, and R. E. Rajala. May 73, 28p
Contract W-7405-eng-36

Descriptors: (*Pdp computers, *Equipment interfaces), (*Lampf linac, *Data acquisition systems), Camac system, Design, Electronic equipment, Operation, Programming.

For abstract, see NSA 28 03, number 06533.

LBL-1569/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
ABSOLUTE STANDARD FOR MEASURING COMPUTER SYSTEM PERFORMANCE.
D. F. Stevens. Jan 73, 7p CONF-730604-2
Contract W-7405-eng-48

Descriptors: (*Computers, *Performance), Calibration standards.

For abstract, see NSA 28 03, number 07739.

N73-28047/1GA PC$6.75/MF$1.45
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
AN UPDATE OF INPUT INSTRUCTIONS TO TEMOD.
18 Jun 73, 92p NASA-CR-121225, WANL-TME-1906A
NASA ORDER C-21029-C, Contract AT(04-3)-701

Descriptors: *Computer programs, *Fortran, *Input/output routines, *Programmed instruction, Generators, Mathematical models, Performance.

For abstract, see STAR 1119

N73-28048/9GA PC$5.50/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
STUDY OF A HYBRID MULTISPECTRAL PROCESSOR.
R. E. Marshall, and F. J. Kriegler. Jul 73, 68p
NASA-CR-133976, ERIM-31650-154-T
Contract NAS9-9784

Descriptors: *Computer programming, *Hybrid computers, *Multispectral band scanners, Digital computers, Digital systems.

For abstract, see STAR 1119

N73-28049/7GA PC$4.00/MF$1.45
Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
ON-BOARD PROCESSING FOR DATA COLLECTION SATELLITE SYSTEMS.
Final Report.
G. R. Cooper, and F. Fellinger. 18 Feb 72, 38p
NASA-CR-132792
Contract NGR-15-005-143

Descriptors: *Data processing, *Onboard equipment, *Satellite networks, Data acquisition, Error analysis, Frequency measurement, Probability density functions, Signal to noise ratios.

For abstract, see STAR 1119

N73-28052/1GA PC$4.25/MF$1.45
Teledyne Brown Engineering, Huntsville, Ala. Science and Engineering.
DEVELOPMENT OF MULTIPLE USER AMTRAN ON THE DATACRAFT DC6024.
Final Report, 25 Dec. 1971 - 23 Feb. 1973.
S. L. Austin. Jun 73, 41p NASA-CR-124330, SE-MSFC-1731
Contract NAS8-26756

Descriptors: *Airborne/spaceborne computers, *Multiple output programs, Computer programs, Documentation, Flow charts.

For abstract, see STAR 1119

N73-28053/9GA PC$5.50/MF$1.45
National Physical Lab., Teddington (England). Div. of Computer Science.
COMPUTER NETWORK SIMULATION STUDY.
R. Healey. Jan 73, 67p NPL-COM-SCI-64, NPL-COM-SCI-45
Misc-Supersedes Npl-COM-Sci-45.

Descriptors: *Computerized simulation, *Data transmission, *Electric networks, *Network analysis, Digital data, Minicomputers, Queueing theory, Switching, Time lag, Traffic.

For abstract, see STAR 1119

N73-28056/2GA PC$3.25/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
PATTERN RECOGNITION AS A STATISTICAL METHOD FOR ANALYZING THE CONFIDENCE LEVEL IN THE IDENTIFICATION OF OBJECTS.
M. Debruin, P. J. M. Korthoven, R. P. W. Duin, F. C. A. Groen, and C. C. Bakels. 1972, 22p IRI-133-72-11

Descriptors: *Confidence limits, *Pattern recognition, *Sampling, *Statistical analysis, *Trace elements, Law (Jurisprudence), Neutron activation analysis, Probability distribution functions, Standard deviation.

For abstract, see STAR 1119

N73-28124/8GA PC$7.00/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
FERRITE LOGIC RELIABILITY STUDY.
Final Report.
J. A. Baer, and C. B. Clark. Jul 73, 99p NASA-CR-132265
Contracts NAS1-11453, SRI PROJ. 1832

Descriptors: *Ferrimagnetic materials, *Logic circuits, *Reliability engineering, Digital systems, Electronic equipment.

For abstract, see STAR 1119

PATENT-3 219 997/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ANALOG-TO-DIGITAL CONVERTER.
Patent.
L. L. Lewyn. Patented 23 Nov 65, 6p NASA-CASE-XNP-00477,
Misc-Filed 26 Feb. 1962. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Amplitude distribution analysis, *Analog to digital converters, *Pulse amplitude, Patents, Signal measurement, Tunnel diodes.

An analog to digital converter circuit arrangement is reported that is suitable for use in ultra fast pulse height analysis. The circuit uses series connected tunnel diodes to quantize a voltage signal into discrete levels.

PATENT-3 402 265/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PSEUDONOISE (PN) SYNCHRONIZATION OF DATA SYSTEM WITH DERIVATION OF CLOCK FREQUENCY FROM RECEIVED SIGNAL FOR CLOCKING RECEIVER PN GENERATOR.
Patent.
L. A. Couvillon, Jr.. Patented 17 Sep 68, 11p
NASA-CASE-XNP-03623,
Misc-Filed 12 Jul. 1965. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Data processing, *Digital systems, *Frequency synchronization, *Telecommunication, Carrier frequencies, Patents, Phase modulation, Signal processing.

A digital communicating system for automatically synchronizing signals for data detection is described. The systems consists of biphase modulating a subcarrier frequency by the binary data and transmitting a carrier phase modulated by this signal to a receiver, where coherent phase detection is employed to recover the subcarrier. Data detection is achieved by providing, in the receiver, a demodulated reference which is in synchronism with the unmodulated subcarrier in transmitting system. The output of the detector is passed through a matched filter where the signal is integrated over a bit period. As a result, random noise components are averaged out, so that the probability of detecting the correct data transmitted is maximized.

PB-223 388/0GA PC$3.25/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
ON SIMPLE GOEDEL NUMBERINGS AND TRANSLATIONS.
Technical rept.,
J. Hartmanis, and T. P. Baker. Jul 73, 25p CU-CSD-73-179
Grant NSF-GJ-33171

Descriptors: (*Programming languages, *Recursive functions), Set theory, Automata theory, Permutations, Theorems.
Identifiers: Computational complexity, Goedel numberings.

In the paper the authors consider Goedel numberings (viewed as simple models for programming languages) into which all other Goedel numberings can be translated very easily. Several such classes of Goedel numberings are defined and their properties are investigated. The authors also compare these classes of Goedel numberings to optimal Goedel numberings and show that translation into optimal Goedel numberings can be computationally arbitrarily complex. (Author)

PB-223 572/9GA PC$2.75/MF$1.45
Stanford Univ., Calif. Dept. of Computer Science.
A REVIEW OF 'STRUCTURED PROGRAMMING',
D. E. Knuth. Jun 73, 27p STAN-CS-73-371
Grant NSF-GJ-36473

Descriptors: (*Computer programming, Reviews), Mathematical logic, Syntax, Algorithms.
Identifiers: *Structured programming, Data structures.

The recent book Structured Programming by O. J. Dahl, E. W. Dijkstra, and C.A.R. Hoare promises to have a significant impact on computer science. The report contains a detailed review of the topics treated in that book, in the form of three informal open letters to the three authors. It is hoped that circulation of these letters to a wider audience at this time will help to promote useful discussion of the important issues. (Author)

RHEL/R-244/GA PC$5.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
GFUN USERS' GUIDE: A USER GUIDE TO AN INTERACTIVE GRAPHICS PROGRAM FOR THE COMPUTER AIDED DESIGN OF MAGNETS.
M. J. Newman, J. Simkin, C. W. Trowbridge, and L. R. Turner. Sep 72, 58p
U.S. Sales Only.

Descriptors: (*Computer codes, *G codes), Magnets, Planning.

For abstract, see NSA 28 03, number 07765.

RISO-M-1574/GA PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
SEMIAUTOMATIC SET-UP AND TESTING OF DIODE FUNCTION GENERATORS IN THE HYBRID COMPUTER EAI 600-PDP8/I,FPP12.
K. S. Hoejberg. Jan 73, 18p
U.S. Sales Only.

Descriptors: (*Analog computers, *Functions), D codes, Electronic equipment, Mathematics.

For abstract, see NSA 28 02, number 04985.

RT/EDP-(73)1/GA PC$3.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
RELEASE: A COMMAND PROCESSOR TO RELEASE UNUSED SPACE IN TSO DATA SETS.
C. Corradi. 16 Nov 72, 31p
U.S. Sales Only.

Descriptors: (*Data processing, *Computer codes), R codes.

For abstract, see NSA 28 03, number 07638.

SC-DC-720674/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
STRATEGY FOR THE USE OF A MINICOMPUTER-BASED TEST SYSTEM AS A GENERAL-PURPOSE NDE LABORATORY TOOL.
B. Stiefeld. (nd). 9p CONF-730606-2

Descriptors: (*Computers, *Uses), Control, Nondestructive testing.

For abstract, see NSA 28 03, number 07639.

SCL-DR-720361/GA PC$3.25/MF$1.45
Sandia Labs., Livermore, Calif.
SUPPLEMENT TO SHOCK CODE REPORT SCL-DR-69-98.
V. K. Gabrielson. Jan 73, 21p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *S codes), Fortran, Mechanics, Nonlinear problems, Simulators.

For abstract, see NSA 28 02, number 04987.

SLA-73-349/GA PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
COSMOS: CENTRIFUGE OPERATING SYSTEM PROGRAM.
D. M. Darsey. Apr 73, 40p

Descriptors: (*Centrifuges, Computer codes), (*Computer codes, *C codes), Magnetic tapes, Operation.

For abstract, see NSA 28 03, number 07640.

SLA-73-5292/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
COMPUTER SYSTEMS PERFORMANCE MONITORING AT SANDIA LABORATORIES, ALBUQUERQUE.
R. F. Jr. Davis. 8p CONF-730522-1

Descriptors: (*Computers, *Performance testing), Control, Performance.

For abstract, see NSA 28 03, number 07642.

SLL-73-232/GA PC$3.00/MF$1.45
Sandia Labs., Livermore, Calif.
USERS' MANUAL FOR PROGRAM LETTER.
B. E. Affeldt. Apr 73, 15p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *L codes), Manuals, Programming languages.

For abstract, see NSA 28 03, number 07643.

SLL-73-5201/GA PC$3.00/MF$1.45
Sandia Labs., Livermore, Calif.
PERFORMANCE AND METHODOLOGY OF A DIGITAL RANDOM VIBRATION CONTROL SYSTEM.
D. B. Nelson. 7p CONF-730401-4

Descriptors: (*Digital systems, *Control systems), Mechanical vibrations, Randomness.

For abstract, see NSA 28 02, number 04989.

UCID-16140(Rev.1)/GA PC$3.50/MF$1.45
California Univ., Livermore. Lawrence Radiation Lab.
ASSEMBLER PROGRAM FOR THE INTEL MCS-8 8008 CPU.
W. Jr. Magnuson. 15 Feb 73, 26p

Descriptors: (*Computer codes, *M codes), Cdc computers, Manuals, Programming languages.

For abstract, see NSA 28 03, number 07647.

UCID-30056/GA PC$4.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SPECIFICATIONS OF A FORTRAN CALLABLE GRAPHICS SUBROUTINE PACKAGE (GRAFPAC).
M. River, and N. Storch. 26 Jan 73, 42p
Contract W-7405-eng-48

Descriptors: (*Computers, *Diagrams), Fortran, G codes.

For abstract, see NSA 28 02, number 04992.

UCID-30057/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
HIDDEN SURFACE PROCESSING.
M. Archuleta. 23 Mar 73, 20p
Contract W-7405-eng-48

Descriptors: (*Data processing, *Computer codes), (*Interactive display devices, Computer codes), Fortran.

For abstract, see NSA 28 02, number 04958.

UCID-30058/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
INTERACTIVE SURFACE PLOTTING.
M. Archuleta. 23 Mar 73, 9p
Contract W-7405-eng-48

Descriptors: (*Interactive display devices, *Surfaces), Computer codes, Geometry, Three-dimensional calculations.

For abstract, see NSA 28 02, number 04959.

WAPD-TM-1080/GA PC$7.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA.
APACHE: A THREE-DIMENSIONAL FINITE ELEMENT PROGRAM FOR STEADY-STATE OR TRANSIENT HEAT CONDUCTION ANALYSIS.
D. N. Hutula, B. E. Wiancko, and S. M. Zeiler. Mar 73, 111p
Contract AT(11-1)-Gen-14

Descriptors: (*Computer codes, A codes), (*Heat transfer, A codes), Cdc computers, Finite element method, Fortran.

For abstract, see NSA 28 02, number 02510.

Y-1870/GA PC$5.45/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
MACHINE TOOL CONTROL VIA A MINICOMPUTER.
G. L. Bowers. 18 Apr 73, 73p
Contract W-7405-eng-26

Descriptors: (*Computers, *Control systems), (*Machine tools, Control systems), Shells.

For abstract, see NSA 28 02, number 04995.

9C. Electrical and Electronic Engineering

AD-767 631/5GA PC$3.00/MF$1.45
Dayton Univ Ohio Research Inst
AN INEXPENSIVE UNIVERSAL STEPPING MOTOR CONTROLLER.
Final rept. Feb-Jun 72,
Dennis E. Wisnosky, and James S. Solomon. Jul 73, 28p* AFML-TR-73-169
Contract F33615-72-C-1372

Descriptors: (*Electric motors, *Control systems), Digital systems, Circuits, Induction motors.
Identifiers: Stepper motors.

Many instruments for scientific research and development employ one or more motors for control of some function, or to position, shafts, gratings, mirrors, recorders, etc. Use of this factor provides one of the most simple and economical methods of automating this equipment. The report describes a universal stepping motor controller that is extremely versatile and can be built inexpensively. Control is provided to run the motor in either forward or reverse directions in single steps, or slew at one of eight set rates. Given a number of steps and number of intervals which are multiple of the step size, it may be set to scan automatically under external control or manually. Complete circuit operations and construction details are provided as are some example applications. (Author)

DUN-SA-200/GA PC$3.00/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
PROTECTION OF SYNCHRONOUS MOTORS FOR OUT-OF-STEP OPERATION DURING A POWER SYSTEM DISTURBANCE.
W. R. Thorson. 26 Apr 73, 13p CONF-730430-1

Descriptors: (*Motors, *Relays), Disturbances, Power supplies.

For abstract, see NSA 28 03, number 07714.

N73-28086/9GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
COOLABLE CALIBRATING RESISTANCE AS NOISE TEMPERATURE STANDARD.
P. G. Mezger, and H. Rother. Aug 73, 18p NASA-TT-F-15016
Contract NASW-2483
Tran-Transl. Into English from Frequenz (West Berlin), V. 16, No. 10, 1962 p 386-391.

Descriptors: *Electrical resistance, *Electronic equipment, *Low noise, *Standards, Antennas, Calibrating, Noise generators, Preamplifiers, Receivers.

For abstract, see STAR 1119

PB-223 936/6GA PC$3.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
APPROXIMATE TRANSMISSION NETWORK MODELS FOR USE IN ANALYSIS AND DESIGN.
Final rept.,
D. Crevier. Jun 72, 40p MIT-EL-73-008
NSF-GI-32874

Descriptors: (*Power transmission lines, Network synthesis), Network analysis theory, Network flows, Power loss, Electric power transmission.

A wide range of power system expansion planning techniques require a very large number of solutions for the real power flows in the line for a given transmission network. The use of complete A-C load flow techniques for solving the exact nonlinear equations can easily lead to prohibitive com-

putation requirements. It is the purpose of this paper to investigate and compare three approximate models and solution technique: the so-called D-C model, a model permitting the use of linear programming, and a simplified model using only the rated maximum real power flows in the lines. (Author)

SLA-73-5280/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
COUPLING OF HIGH FREQUENCY ELECTROMAGNETIC ENERGY INTO LARGE SYSTEMS.
G. B. Varnado. 1972, 16p CONF-730615-2

Descriptors: (*Electronic equipment, *Physical radiation effects), (*Radar, Physical radiation effects), Aircraft, Electromagnetic radiation, Missiles.

For abstract, see NSA 28 03, number 07791.

9D. Information Theory

AD-767 057/3GA PC$5.25/MF$1.45
California Univ Los Angeles Dept of System Sciences
ON THE EVALUATION OF RATE DISTORTION FUNCTIONS.
Technical rept.,
Harry Hu Tan. Jul 73, 181p Rept no. UCLA-ENG-7356
Contract N00014-69-A-0200-4043

Descriptors: (*Information theory, Statistical analysis), Coding, Communication systems, Stochastic processes, Decoding, Probability density functions, Measure theory, Theorems.
Identifiers: *Rate distortion functions, Markov processes, Data transmission.

The rate distortion function of a source represents the minimum information rate at which the source can be transmitted to be reproduced within some prescribed average distortion. This function is of considerable interest in source coding and data compression problems. One of the limitations of the usefulness of rate distortion theory is the difficulty in evaluating the rate distortion function for many sources and distortion measures. The research presented in this report is concerned with the evaluation of the rate distortion function for various classes of sources and distortion measures. (Author)

AD-767 083/9GA Reprint
Hawaii Univ Honolulu
WHERE DOES THE INFORMATION COME FROM,
S. Watanabe. 1967, 3p AFOSR-TR-73-1622
Grant AF-AFOSR-1466-68
Availability: Pub. in Proceedings of the Coloquim on Information Theory Organized by the Bolyai Mathematical Society, Debrecen (Hungary), p511-513 1967.

Descriptors: (*Information theory, Probability), Entropy, Difference equations.

The question mentioned in the title of this paper is often asked in a variety of connections. Generally speaking, however, two major categories of cases where this question is raised can be distinguished. One pertains to inductive inference and the other pertains to deductive inference. In the inductive case, a typical question runs somewhat like this: human mind being an information transducer, it can lose but not gain information. How can it then create information so that the world may not run entirely out of information. To make any sense out of this vague question, the author has to reformulate it considerably and eliminate hidden confusions. In the paper the author does not enter into details of the inductive case, except to point out that the analogy of information transducer is inapplicable to inductive learning since there is no such thing as an ergodic source of input hypotheses and that the information about the law and the amount of information that can be drawn from the law are two entirely different concepts. In the paper, the author discusses only the deductive case.

AD-767 126/6GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON THE CONSTRUCTION OF MINIMUM BANDWIDTH FUNCTIONS FROM DISCRETE DATA.
Technical summary rept.,
Rui J. P. de Figueiredo, and A. N. Netravali. May 73, 24p Rept no. MRC-TSR-1328
Contract DA-124-ARO(D)-462

Descriptors: (*Information theory, Functions), Transcendental functions, Approximation(Mathematics), Theorems.
Identifiers: Spline functions, Spline approximation, Data transmission.

A solution is obtained, in the form of an extension of an appropriate L-spline, to the problem of constructing from discrete data a smooth complex-valued function g on a bounded interval of the real line so that the mean-square bandwidth or a generalized bandwidth of g is minimized, subject to an energy constraint. (Author)

AD-767 276/9GA PC$3.00/MF$1.45
Pattern Analysis and Recognition Corp Rome N Y
ORTHONORMAL EXPANSION STUDY FOR WAVEFORM PROCESSING SYSTEM (WPS).
Technical rept. Feb 72-Feb 73,
Donald H. Foley. Jul 73, 27p Rept no. PAR-73-15
RADC-TR-73-168
Contract F30602-72-C-0193

Descriptors: (*Information theory, Pattern recognition), Integral transforms, Matrix algebra, Statistical analysis.
Identifiers: Waveforms, Feature selection, Karhunen-Loeve transformation, Signal processing, Discriminant functions.

The report discusses the results of an orthonormal waveform expansion study conducted by Pattern Analysis and Recognition Corporation (PAR) during the early phase of contract F30602-72-C-0193. The purpose of the study was the determination of which orthonormal expansions and associated displays would be most useful to the Waveform Processing System (WPS) user. (Author)

AD-767 641/4GA PC$3.00/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
ESTIMATION OF THE TWO-DIMENSIONAL SPECTRUM OF THE SPACE-TIME NOISE FIELD FOR A SPARSE LINE ARRAY.
Technical rept.,
Albert H. Nuttall, Ernest M. Montavon, and G. Clifford Carter. 22 Aug 73, 42p Rept no. NUSC-TR-4607

Descriptors: (*Information theory, Sound signals), Noise, Correlation techniques, Power spectra, Integral transforms, Fourier analysis, Interpolation, Computer programs.
Identifiers: Fourier transformation, Fast Fourier transform, Signal processing, Spectrum analysis, Beam forming, FORTRAN, Plane waves.

For a line array immersed in a stationary homogeneous noise field composed of plane waves of differing speeds and angles of arrival, standard beamforming is not useful for estimating the noise spectrum directionality. However, the two-dimensional spectrum of the received noise field enables resolution in temporal-frequency and in spatial-frequency and can thereby indicate the temporal-frequency content and the apparent speed along the line array of plane wave arrivals. The interrelationships and attributes of the space-time correlation, the cross-spectrum, and the two-dimensional spectrum are presented and interpreted via simple examples. A program for estimation of the two-dimensional spectrum for a sparse line array and examples of its use and interpretation are given. (Author)

N73-27113/2GA PC$3.50/MF$1.45
Australian Post Office Research Labs., Melbourne.
SIMULATION TESTING OF A NEW DIGITAL DETECTION SCHEME FOR DIGITALLY-ENCODED MULTIFREQUENCY TONES.
M. A. Wilson. Jan 73, 27p REPT-6755

Descriptors: *Detectors, *Digital simulation, *Performance tests, *Voice data processing, Decoding, Digital filters.

For abstract, see STAR 1118

N73-27516/6GA PC$5.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STATISTICAL PROPERTIES OF FILTERED PSEUDORANDOM DIGITAL SEQUENCES FORMED FROM THE SUM OF MAXIMUM-LENGTH SEQUENCES.
G. R. Wallace, G. D. Weathers, and E. R. Graf. 9 Jul 73, 60p NASA-TM-X-64758

Descriptors: *Multichannel communication, *Pseudonoise, *Pseudorandom sequences, *Systems analysis, Algorithms, Computer programs, Filters, Signal analysis.

For abstract, see STAR 1118

9E. Subsystems

AD-767 079/7GA PC$3.75/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
DESIGN SPECIFICATION OF AN LSI MODULAR FUNCTIONAL BUILDING BLOCK,
L. P. McNamee, and R. N. Nilsen. Sep 72, 32p Rept no. UCLA-ENG-7294
Contract N00123-72-C-0297

Descriptors: (*Integrated circuits, Design), Matrix algebra, Algorithms, Modules(Electronics), Logic circuits, Simulation.
Identifiers: *Large scale integrated circuits, *Logic design, Computerized simulation, Digital filters.

The report summarizes the results of a one-year research program undertaken to investigate the design specification of an LSI Modular Building Block with possible applications to Naval Systems. The investigation essentially consisted of four areas: Definition of problem areas including applications, organizational requirements and design tools; Definition of functional blocks for specific applications in particular digital differential analyzers; Organization and design of the AX+B module, in particular, various logical designs of the AX+B module and, simulatiop studies to evaluate both AX+B module designs and specific application configurations. (Author)

AD-767 400/5GA PC$3.50/MF$1.45
RCA Labs Princeton N J
ELECTROLUMINESCENT DIODE SWITCHES.
Final rept. 1 Jan-31 Dec 72,
Charles J. Nuese. Jan 73, 70p Rept no. PRRL-73-CR-5
Contract N00014-72-C-0251

Descriptors: (*Display systems, *Photodiodes), Gallium arsenides, Phosphides, Diodes(Semiconductor), Epitaxial growth, Electroluminescence, Electrical properties, Manufacturing methods.

Identifiers: Electroluminescent panels, Alphanumeric displays, Light emitting diodes, Gallium phosphides, Schottky diodes, Electroluminescent diodes.

GaAs and GaAs(1-x)P(x) p-n-p-n Shockley diode structures have been prepared by an epitaxial vapor-phase growth technique. The two-terminal devices exhibit a negative-resistance I-V characteristic, which allows them to be used as an electroluminescent diode with a built-in latching (memory) capability. The FaAs diodes have breakover voltages between 2 and 3 V at room temperature. After breakdown, they emit near-bandgap infrared radiation with external quantum efficiencies as high as 0.4%. The emission spectra have been found to consist of two peaks, one corresponding to recombination in the innermost n-layer, and the other corresponding to recombination in one of the two p-type layers. The emission for the GaAs diodes occurs uniformly over the entire surface area. A 5-by-7 alphanumeric display was fabricated from the GaAs vapor grown diodes. These devices are addressed by the superposition of positive and negative pulses to the appropriate rows and columns, respectively. The successful generation of a variety of characters by this technique had demonstrated the feasibility of the Shockley diode concept for display applications. Future technological problems associated with such a display are discussed. (Modified author abstract)

AD-767 492/2GA Reprint
California Univ Berkeley Coll of Engineering
DESIGN OF SCHOTTKY-BARRIER DIODE CLAMPED TRANSISTOR LAYOUTS,
Raymond A. Heald, and David A. Hodges. 20 Dec 72, 8p AFOSR-TR-73-1889
Contract F44620-71-C-0087
Presented at the International Solid-State Circuits Conference, Philadelphia, Pa., Feb 73. Revision of report dated 27 Apr 72.
Availability: Pub. in IEEE Jnl. of Solid-State Circuits, vSC8 n4 p269-275 Aug 73.

Descriptors: (*Integrated circuits, Design), Diodes(Semiconductor), Transistors, Logic circuits, Mathematical models, Voltage.
Identifiers: Schottky barrier diodes, Equivalent circuits, Clamping diodes.

The paper describes an approach to the design of Schottky-clamped integrated circuit transistor layouts. Three-dimensional distributed resistances are modeled using a grid of lumped resistors. A computer circuit analysis program is used to obtain a simple lumped equivalent circuit for the clamped transistor. The equivalent circuit enables accurate prediction of the useful range of dc operating conditions for a given structure. An improved small-area clamped transistor layout has been developed using this approach. (Author)

AD-767 644/8GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
SURVEY OF SOLID STATE REFLECTIVE/TRANSMISSIVE DISPLAY MEDIA.
Final rept.,
D. L. Mitchell, and L. A. Rauber. Sep 73, 36p Rept no. NRL-MR-2657

Descriptors: (*Display systems, Design), (*Aircraft equipment, Display systems), Feasibility studies, Performance(Engineering), Semiconductors, Color centers, Sodium compounds, Fluorides, Ferromagnetic materials, Ferroelectric crystals, Bismuth compounds, Titanates, Ceramic materials.
Identifiers: Amorphous semiconductors, Sodium fluorides, Yttrium iron garnet, Bismuth titanates.

A survey of basic research was conducted to determine the feasible solid state media candidates for use in high contrast aircraft cockpit displays operating in a reflective or transmissive mode. A model for reflective and transmissive displays was developed in order to relate display performance to physical poperties of the media. Threshold levels were set and candidates screened against these criteria. No solid state candidates passed this screening in all respects. PLZT ceramic plates and alkali halide M-centers were found to be acceptable with reservations and warrant further consideration. (Author)

AD-767 654/7GA PC$7.25/MF$1.45
Naval Postgraduate School Monterey Calif
AN APPLICATION OF THE PIECEWISE-SINUSOIDAL REACTION MATCHING TECHNIQUE TO LINEAR DIPOLE ANTENNAS.
Master's thesis,
Michael Lynn Bryant. Jun 73, 105p

Descriptors: (*Dipole antennas, Electrical impedance), Electric currents, Matrix algebra, Computer programs, Theses.
Identifiers: Piecewise sinusoidal reaction matching technique, Current distribution, FORTRAN, Method of moments.

The paper is an application of the Piecewise-Sinusoidal Reaction Matching Technique (PSRMT) to linear, parallel thin-wire dipoles. The 'method of moments' is briefly outlined and the fundamental electromagnetic principles of reciprocity, surface equivalence and reaction are discussed. Through a logical combination of these concepts, PSRMT is developed and applied to thin-wire dipoles radiating in free space due to a delta function voltage generator at their center. The driving point impedance and the current distribution are calculated and compared to results obtained from other independent theoretical techniques. (Modified author abstract)

COM-73-11465/4GA PC$3.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
WAVELENGTH OF A SLOTTED RECTANGULAR LINE CONTAINING TWO DIELECTRICS.
Rept. for Aug 71-Nov 72,
Howard E. Bussey. Jul 73, 18p NBSIR-73-326
Sponsored by Army Mobility Equipment Research and Development Center.

Descriptors: (*Waveguides, Electromagnetic wave transmission), Waveguide slots, Dielectrics, Capacitance, Measurement.
Identifiers: *Slotted section.

The titled electromagnetic wave property is obtained approximately for a rectangular slab line with two dielectrics. The perturbing dielectric is a thin sheet set on the center conductor and slotted to permit travel of the probe when the line is used as a slotted line. The purpose is to measure an unknown dielectric filling most of the line, but perturbed by the thin sheet. (Author)

COM-73-50783/2GA Not available NTIS
National Bureau of Standards, Washington,D.C.
ACCURATE MEASUREMENT OF ANTENNA GAIN AND POLARIZATION AT REDUCED DISTANCES BY AN EXTRAPOLATION TECHNIQUE.
Final rept.,
Allen C. Newell, Ramon C. Baird, and Paul F. Wacker. 1973, 14p
Pub. in IEEE, Transactions on Antennas and Propagation, AP-21 n4 p418-431 Jul 73.

Descriptors: (*Antennas, Tests), Amplification, Polarizing, Extrapolation.

A new technique is described for determining power gain and polarization of antennas at reduced range distances. It is based on a generalized three-antenna approach which, for the first time, permits absolute gain and polarization measurements to be performed without quantitative a priori knowledge of the antennas. The required data are obtained by an extrapolation technique which includes provisions for rigorously evaluating and correcting for errors due to proximity and multipath interference effects. The theoretical basis provides a convenient and powerful approach for describing and solving antenna measurement problems, and the experimental method employed illustrates the utility of this approach. Examples of measurements are included which exhibit errors in gain as small as plus or minus 0.11dB (3 sigma).

COM-73-50805/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
CONSIDERATIONS FOR THE PRECISE MEASUREMENT OF AMPLIFIER NOISE.
Technical note,
David F. Wait. Aug 73, 133p NBS-TN-640
Paper copy available from GPO $1.25 as C13.46:640.

Descriptors: (*Amplifiers, *Electromagnetic noise), Measurement, Thermal noise, Computer programs, Errors.

For the best accuracy in measuring noise figure, attention should be given to the choice of the hot and the cold noise standards and to mismatch problems. Tables and graphs are presented to aid in choosing the proper measurement conditions, and an example is given to demonstrate their use. This paper essentially supplements a previous paper (included in an appendix), treating in more detail topics that become important when state-of-the-art measurements are required.

N73-27103/3GA PC$3.00/MF$1.45
Tokyo Univ. (Japan).
RECEPTION CHARACTERISTICS OF MONOPOLE ANTENNAS FOR ELECTRON PLASMA WAVES,.
Y. Nakamura, M. Nakamura, and T. Itoh. May 73, 14p ISAS-491

Descriptors: *Antenna radiation patterns, *Dipole antennas, *Electron radiation, *Plasma waves, Equations of motion, Signal reception.

For abstract, see STAR 1118

N73-27110/8GA PC$3.00/MF$1.45
Ohio State Univ., Columbus. ElectroScience Lab.
THE RADIATION FROM APERTURES IN CURVED SURFACES.
P. H. Pathak, and R. G. Kouyoumjian. Jul 73, 79p
NASA-CR-2263
Contract NGR-36-008-144

Descriptors: *Aircraft antennas, *Radio transmission, *Slot antennas, Computerized design, Diffraction, Electric fields.

For abstract, see STAR 1118

N73-27155/3GA PC$3.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
NONLINEAR AND PARAMETRIC EFFECTS IN ELECTRON TRANSFER GENERATORS ETUDE DES EFFETS NON LINEAIRES ET PARAMETRIQUES DANS LES OSCILLATEURS A TRANSFERT D'ELECTRONS RAPPORT ANNUEL.
Annual Report.
F. Diamand. Dec 71, 8p
Contract DGRST-70-72-355
Language in French.

Descriptors: *Electron transfer, *Microwave oscillators, *Mixing circuits, *Synchronism, Diodes, Negative resistance devices, Nonlinearity.

For abstract, see STAR 1118

N73-27394/8GA PC$5.25/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
INTERFEROMETRIC SYSTEM FOR MICROELECTRONIC LARGE SCALE INTEGRATION ENSEMBLE INTERFEROMETRIQUE POUR INTEGRATION A GRANDE ECHELLE EN MICROELECTRONIQUE COMPTE-RENDU DE FIN DE CONTRAT.
Final Report.
M. Lacombat, and A. Gerard. 10 Dec 71, 62p LCR-71-213/1/R
Contract DGRST-69-01-891-01
In French; English Summary.

Descriptors: *Large scale integration, *Translational motion, *X-y plotters, Addressing, Computer programming, Differential interferometry, Helium-neon lasers, Pattern registration, Positioning.

For abstract, see STAR 1118

N73-28552/0GA PC$3.00/MF$1.45
Defence Research Establishment Valcartier (Quebec).
DISPLAY TECHNIQUES FOR A LADAR TARGET IMAGING SYSTEM.
J. F. Boulter. May 73, 17p DREV-TN-2075/73
Contract DREV PROJ. 97-82-10

Descriptors: *Digital data, *Display devices, *Imaging techniques, *Pattern recognition, Cathode ray tubes, Hybrid computers, Targets.

For abstract, see STAR 1119

PAT-APPL-374583/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
DIGITAL SERVO CONTROLLER.
Patent Application.
F. Byrne. Filed 28 Jun 73, 18p NASA-CASE-KSC-10769-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antenna components, *Rotating shafts, *Servocontrol, Digital systems, Patent applications, Pointing control systems.

A system is reported for generating a signal for controlling the rotation of a shaft supporting an antenna so that the antenna is rotated the shortest angular distance from a present angular position to a new desired angular position. The system comprises a shaft encoder which generates a digital encoder signal indicating the present position of the shaft. A command signal is compared with the encoder signal to produce an analog signal for rotating the antenna. An error signal is produced for controlling the direction of rotation of the antenna.

PATENT-3 480 793/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
LOGARITHMIC FUNCTION GENERATOR.
Patent,
Michael G. Strauss. Filed 2 Aug 66, patented 25 Nov 69, 6p PAT-APPL-569 761
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Function generators, *Patents), Logarithm functions, Voltage amplifiers.
Identifiers: PAT-CL-307-229.

The circuit described in the patent produces an output signal which is a logarithmic function of pulsed input voltage signals. A voltage-to-current converter changes the applied input pulse to a current pulse which is coupled by way of a gate to a logarithmic function generator. The applied input pulses also generate control signals for actuating the gate so that an output signal is produced only when an applied input pulse is present.

PATENT-3 680 127/GA Not available NTIS
Department of the Air Force Washington D C
TUNABLE OMNIDIRECTIONAL ANTENNA.
Patent,
David J. Richard. Filed 7 Apr 71, patented 25 Jul 72, 10p Rept nos. PAT-APPL-132 016,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Omnidirectional antennas, *Patents), Tuning devices, Printed circuits, Very high frequency, Ultrahigh frequency.
Identifiers: PAT-CL-343-708, Electrically small antennas.

The patent describes a physically planar omnidirectional antenna having two loaded, concentric, semicircular, radiating members. The antenna has a relatively uniform nominal impedance and a tunable operation over approximately a 3:1 bandwidth with a protrusion above the ground plane of less than one-tenth wavelength at the high frequency end of the operating bandwidth.

PATENT-3 680 129/GA Not available NTIS
Department of the Air Force Washington D C
AIRCRAFT TOWED INFLATABLE ANTENNA.
Patent,
John H. Darrah, James C. Bell, Jerome J. Vorschek, John W. Bezbatchenko, and George A. Blecker. Filed 29 Apr 71, patented 25 Jul 72, 6p Rept nos. PAT-APPL-138 424,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Antennas, Inflatable structures), (*Patents, Antennas), Towed bodies, Airborne, Simulators, Electromagnetic pulses, Nuclear explosions.
Identifiers: PAT-CL-343-706.

The patent comprehends a towed airborne electromagnetic radiating pulse antenna simulator. The antenna simulates the rf energy spectrum of radiation emitted from a nuclear detonation. It consists of a helium inflated centerbody to which are appended two trailing wire cages, the whole of which is towed by either an aircraft or helicopter. The inflated semi-rigid centerbody has extended lengths of wire cages which extend the effective antenna length. Electrical performance is enhanced by means of continuous resistive surfaces and lumped resistance elements located between cage segments.

PATENT-3 699 584/GA Not available NTIS
Office of the Secretary of the Army Washington D C
INSERTION PHASE CORRECTION OF PHASE SHIFTERS BY PRESETTING BINARY COUNTERS.
Patent,
George A. Hrivnak, and Vincent J. Organic. Filed 30 Dec 70, patented 17 Oct 72, 5p Rept nos. PAT-APPL-102 748,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Phase shifters, *Patents), Logic circuits, Digital systems, Phase shift, Corrections.
Identifiers: Counting circuits, PAT-CL-343-854.

The patent relates to a method of inserting into a phase shifter the necessary amount of insertion phase shift to correct for departure of phase shift from an acceptable value for that phase shifter resulting from normal inadequate production tolerances. The method involves using in the logic-driver circuit for the phase shifter a counter whose digital output determines the magnitude of the phase shift command applied to the phase shifter. The input to the counter is preset in accordance with the amount of phase shift correction determined from the phase shift measuring test to be necessary to correct for the undesired phase deviation in the manufacturing process.

PATENT-3 701 026/GA Not available NTIS
Office of the Secretary of the Army Washington D C
MEDIAN FREQUENCY GENERATOR.
Patent,
Frank S. Gutleber. Filed 13 May 71, patented 24 Oct 72, 5p Rept nos. PAT-APPL-142 963,
Government-owned invention available for licensing. Copy of patent invention available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Radiofrequency generators, *Patents), Frequency synthesizers, Signal generators, Relaxation oscillators, Limiters, Pulse generators, Inverter circuits.
Identifiers: PAT-CL-328-15.

The patent describes a median frequency generator which linearly adds two input signals having the same amplitude to obtain a third signal having a frequency equal to the median of the frequencies of the two input signals, an amplitude which varies with time, and a phase which reverses at a frequency equal to the difference in the frequencies of the input signals. Timing pulses are generated by a flip-flop in synchronism with the phase reveals and are used as gating signals to invert the phase reversed portions of the third signal to produce the median frequency output signal.

PATENT-3 706 487/GA Not available NTIS
Office of the Secretary of the Army Washington D C
PHOTOCHROMIC PROJECTION SYSTEM.
Patent,
Salvatore F. LaForgia. Filed 4 May 71, patented 19 Dec 72, 5p Rept nos. PAT-APPL-140 176,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Display systems, *Patents), Map projection, Photochromism.
Identifiers: PAT-CL-353-11, *Photochromic film display systems, *Projectors.

The patent describes a photochromic projection system wherein indicia appearing on a cathode ray tube, and forming an opaque image on an ultraviolet-sensitive film positioned against the end face of the cathode ray tube, is imaged upon a viewing screen after passing through a transparent map. A pair of dichroic filters are used both of which reflect yellow and green radiation so that only the yellow and green portion of the radiation from an external illuminating source for the film is reflected to the film. The red and blue portion of the source radiation is transmitted through one of the dichroic filters and reflected from a mirror through the second dichroic filter where it is recombined with the yellow and green light reflected from the face of the cathode ray tube and from the second dichroic filter to provide an image in white light which then is directed through the transparent map onto the viewing screen.

PATENT-3 723 776/GA Not available NTIS
Department of the Navy Washington D C
TEMPERATURE COMPENSATED ZENER DIODE CIRCUIT.
Patent,
Raymond A. Schulz. Filed 27 Dec 71, patented 27 Mar 73, 6p Rept nos. PAT-APPL-212 268,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Integrated circuits, *Patents), Thermal stability, Voltage, Avalanche diodes, Simulation.
Identifiers: PAT-CL-307-318.

The patent describes a temperature compensated zener diode circuit including a heating circuit and a pair of transistors mounted on a single monolithic integrated circuit chip. The heating circuit is electrically insulated from and thermally coupled to

the transistors. The junctions of said transistors are connected in series with one reverse biased to provide a zener effect and the other forward biased to provide thermal compensation. The combination of heating circuit and transistor junction thermal compensation provide a zener diode circuit of improved stability and accuracy as well as adaptability to employment of present commercially available mono-lithic integrated circuits.

PATENT-3 723 805/GA Not available NTIS
Department of the Navy Washington D C
DISTORTION CORRECTION SYSTEM.
Patent,
Theodore J. Scarpino, and Douglas W. Holbrook.
Filed 12 May 71, patented 27 Mar 73, 10p Rept nos. PAT-APPL-142 706,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Display systems, *Patents), (*Cathode ray tubes, Distortion), Corrections, Deflection.
Identifiers: Head up display systems, PAT-CL-315-27-GD.

The patent describes the combinational distortion correction in a cathode ray tube (CRT) head-up display. The correction is accomplished for both optical distortion and CRT distortion by electronically predistorting the displays that appear on the face of the CRT. The corrections are performed in one step by the implementation of a complete mathematical model describing the combinational distortion patterns. The corrections to the vertical and horizontal CRT deflection voltages are represented as combinations of a plurality of transformation functions which are electronically mechanized by a straight line segment approximation technique where the slope and segment lengths are controlled by diode segment generators.

PATENT-3 723 891/GA Not available NTIS
Department of the Navy Washington D C
FREQUENCY TO VOLTAGE CONVERTER.
Patent,
Thomas B. Whiteley. Filed 12 May 71, patented 27 Mar 73, 5p Rept nos. PAT-APPL-143 678,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Frequency analyzers, Alternating current), (*Patents, Frequency analyzers), Switching circuits, Differentiating circuits.
Identifiers: *Frequency to voltage converters, PAT-CL-329-103.

The patent describes a frequency to voltage converter including a switching circuit responsive to an input signal at each zero crossing in the positive direction to charge a capacitor to a peak negative voltage. The capacitor discharges through a resistor towards a positive voltage until the next zero crossing in the positive direction. The peak voltage charge is coupled to a holding circuit to provide a D.C. voltage proportional to the frequency of the input signal.

PATENT-3 725 824/GA Not available NTIS
Department of the Navy Washington D C
COMPACT WAVEGUIDE-COAX TRANSITION.
Patent,
Filed 20 Jun 72, patented 3 Apr 73, 4p Rept nos. PAT-APPL-264 671,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Waveguide couplers, *Patents), Coaxial cables, Microwave equipment, Standing wave ratios.
Identifiers: PAT-CL-333-21-R.

The patent describes a compact waveguide-to-coaxial transition coupling. It has a half-height waveguide with a shorted termination and with a tapered ridge waveguide section having a port therein one-quarter wavelength from the termination into which port is floatingly fitted a coaxial line termination with impedance matching steps thereon. Inductive buttons on the side walls of the half-height waveguide laterally of the tapered ridge waveguide section provide transition of microwave at a voltage standing wave ratio of 1.1 or less over at least a 13 percent band.

PATENT-3 725 936/GA Not available NTIS
Department of the Navy Washington D C
VHF TRAVELLING WAVE LOOP ANTENNA.
Patent,
Robert P. Sherman. Filed 16 Aug 71, patented 3 Apr 73, 4p Rept nos. PAT-APPL-171 895,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Loop antennas, *Patents), Very high frequency, Multiple operation.
Identifiers: Traveling wave antennas, PAT-CL-343-119.

The patent describes an improved single antenna for serving two channels of an RDF simultaneously by using each of two receivers (or transmitters) as the antenna termination for the other. The antenna features a novel shape in that it is truncated in width to one-half that of prior antennas.

PATENT-3 727 146/GA Not available NTIS
Department of the Navy Washington D C
LINEAR, VOLTAGE VARIABLE, TEMPERATURE STABLE GAIN CONTROL.
Patent,
Richard Smith Hughes. Filed 20 Dec 71, patented 10 Apr 73, 4p Rept nos. PAT-APPL-209 843,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Automatic gain control, *Patents), Transistor amplifiers, Thermal stability, Gain, Circuits.
Identifiers: PAT-CL-330-29, Differential amplifiers, Operational amplifiers.

The patent describes an electronic gain control circuit having first and second differential amplifiers and an operational amplifier. The first differential amplifier is coupled to the input and provides the controlled output. The second differential amplifier is coupled to the first differential amplifier and controls the gain of the circuit. The operational amplifier is coupled to the second differential amplifier for temperature stability and linearity.

PATENT-3 728 647/GA Not available NTIS
Office of the Secretary of the Army Washington D C
WAVEGUIDE PHASE SHIFT ACTUATOR.
Patent,
William H. Bushnell. Filed 4 Nov 71, patented 17 Apr 73, 3p Rept nos. PAT-APPL-195 765,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Actuators, Phase shifters), (*Patents, Actuators), (*Waveguides, Phase shifters), Worm gears.
Identifiers: PAT-CL-333-98-R.

The patent describes an actuator for shifting the phase of an electromagnetic wave inside a waveguide. A worm gear connection controls the input to the actuator and drives a slide in a bi-directional movement. This slide is connected to a platform that controls the position of rods inside the waveguide. The position change of the rods in the waveguide causes a shift in the phase of the electromagnetic wave in the waveguide.

PATENT-3 747 111/GA Not available NTIS
Philco-Ford Corp., Palo Alto, Calif.
COMPOSITE ANTENNA FEED.
Patent.
V. J. Jakstys. Patented 17 Jul 73, 7p NASA-CASE-GSC-11046-1,
Misc-Filed 21 Sep. 1971 Supersedes N72-20155 (10 - 11, p 1439). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Antenna feeds, *Broadband, *Microwave frequencies, *Parabolic reflectors, Patents, Radio communication, Radio frequencies.

A composite antenna feed subsystem concentrated in a small area at the prime focus of the parabola of a satellite parabolic reflector accomodates a plurality of frequency bands. The arrays comprising the subsystem are mounted on the top cover of a communication module. A multimode horn is arranged at the center of the subsystem axis which functions at X- And C-band frequencies, and a cross array consisting of individual elements form the S-band feed, with one arm of the S-band array containing an element mutually shared with the L-band array. Provision is also made for UHF frequencies, and a dipole arrangement for VHF frequencies is arranged around the S-band arms.

PATENT-3701 004/GA Not available NTIS
Office of the Secretary of the Army Washington D C
CIRCUIT FOR GENERATING A REPEATABLE VOLTAGE AS A FUNCTION OF TEMPERATURE.
Patent,
Thomas E. Tuccinardi, and Joseph W. Miller, Jr.
Filed 13 May 71, patented 24 Oct 72, 5p Rept nos. PAT-APPL-143 071,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Voltage regulators, *Patents), Temperature, Temperature sensitive elements, Transistors, Circuits.
Identifiers: Temperature coefficient, PAT-CL-323-69.

The patent describes a circuit for producing a repeatable predetermined voltage as a function of temperature. It includes a component having a known temperature coefficient characteristic. A transistor stage connected to the component multiplies the temperature coefficient. Linear as well as non-linear temperature characteristics can be multiplied by the circuit.

SC-DR-72-887/GA PC$5.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SURVEY OF THE PROPERTIES OF CHROMIUM--GOLD METALLIZATION FOR HYBRID MICROCIRCUITS.
R. L. Jr. Long. Dec 72, 66p

Descriptors: (*Gold, *Electrical properties), (*Chromium, Electrical properties), Adhesion, Chemisorption, Corrosion, Electronic circuits, Films, Microelectronics, Miniaturization, Surface properties.

For abstract, see NSA 28 02, number 05064.

SLA-73-394/GA PC$4.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
CHARACTERISTICS AND DEVELOPMENT REPORT ON THE SA2186 INTEGRATED CIRCUIT.
D. G. Skogmo. Apr 73, 55p

Descriptors: Electric currents, Integrated circuits, Magnetic cores, Mos transistors, Pulses.

For abstract, see NSA 28 03, number 07641.

SLA-73-5066/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
THIN FILM METALLIZATION OF OXIDES IN MICROELECTRONICS.
D. M. Mattox. 1972, 25p CONF-730608-1

Descriptors: (*Films, *Adhesion), (*Oxides, *Bonding), (*Metals, Bonding), Bibliographies, Interfaces, Microelectronics, Nucleation, Reviews, Stability.

For abstract, see NSA 28 03, number 07790.

9F. Telemetry

N73-27118/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO 17 MISSION ANOMALY REPORT NO. 1: ERRONEOUS MEASUREMENTS TRANSMITTED BY TELEMETRY.
May 73, 14p NASA-TM-X-69367, JSC-07985

Descriptors: *Abnormalities, *Apollo 17 flight, *Failure analysis, *Telemetry, Control equipment, Errors, Ground support equipment, Multiplexing.

For abstract, see STAR 1118

PATENT-3 745 255/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
RECEIVER WITH AN IMPROVED PHASE LOCK LOOP IN A MULTICHANNEL TELEMETRY SYSTEM WITH SUPPRESSED CARRIER.
Patent.
S. Butman, and U. Timor. Patented 10 Jul 73, 6p NASA-CASE-NPO-11593-1,
Misc-Filed 18 Aug. 1971 Supersedes N72-20162 (10 -11, p 1440). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Multichannel communication, *Phase locked systems, *Receivers, *Telemetry, Bandpass filters, Patents, Pulse modulation.

A phase lock loop is described for a receiver in a two-channel PSK/PM telemetry system with a suppressed carrier. The receiver inphase channel output is filtered by first and second bandpass filters and the receiver quadrature channel output is filtered by first and second bandpass filters and the receiver quadrature channel output is filtered by third and fourth bandpass filters. The first and third filters have the same bandwidth, centered about the frequency of one subcarrier and is wide enough to pass data around the first harmonic of the subcarrier. The second and fourth bandpass filters have the same bandwidth centered about the frequency of the other subcarrier and is wide enough to pass data around the first harmonic of this 9subcarrier. The outputs of the first and third filters are mixed in one mixer and the outputs of the second and fourth filters are mixed in another mixer. The outputs of the two mixers are weighted to produce a weighted sum signal which is supplied to the loop filter.

10. ENERGY CONVERSION (NON-PROPULSIVE)

N73-28123/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SUPERSONIC AERODYNAMIC CHARACTERISTICS OF THE NORTH AMERICAN ROCKWELL ATP SHUTTLE ORBITER.
G. M. Ware, B. Pencer, Jr., and R. H. Founier. Aug 73, 35p NASA-TM-X-2804, L-8840

Descriptors: *Scale models, *Space shuttle orbiters, *Supersonic flight, Aerodynamic characteristics, Wind tunnel stability tests.

For abstract, see STAR 1119

10B. Power Sources

AD-767 302/3GA PC$4.25/MF$1.45
Pratt and Whitney Aircraft East Hartford Conn
1.5-KW FUEL CELL POWERPLANT.
Final rept. 1 Jul 71-31 Dec 72,
Anthony J. DeCasperis, and Leigh H. Ferguson. 2 Apr 73, 119p Rept no. PWA-4704
Contract DAAK02-70-C-0518

Descriptors: (*Fuel cells, Performance(Engineering)), (*Gas generating systems, *Hydrogen), Auxiliary power plants, Design, Mobile, Automatic, Catalysts, Voltage regulators, Flow charting.
Identifiers: Performance evaluation, Cracking process, Process variables.

Four advanced development model 1.5kw fuel cell powerplants were delivered to the Army for evaluation. The delivery configuration powerplant weighs 292 lbs. and has a volume of 9.7 cubic feet. Startup and Operation are fully automatic and the powerplant operates on JP-4 fuel with a specific fuel consumption of less than 2.2lbs/kwh. Output voltage is adjustable from 26 to 34 volts at any output from 0 to 1.5kw. The powerplant consists of four subsystems, a regenerative thermal cracker, which converts logistic fuel to hydrogen, an acid fuel cell powersection which generates dc power from hydrogen and air, a voltage regulator and an automatic control system. A core technology program was conducted to develop the cracker voltage regulator and automatic control unit. Limited development of the powersection, which is based on commercial technology fuel cells, to tailor the design to Army requirements was also conducted. The program culminated with development testing of a complete powerplant and delivery of four powerplants to the Army. (Author)

AD-767 402/1GA PC$3.50/MF$1.45
Energy Research Corp Bethel Conn
HYDROGEN GENERATOR.
Final technical rept.,
Edward S. Tillman, Jr. Aug 73, 66p Rept no. ERC-0397F
Contract DAAK02-71-C-0397

Descriptors: (*Fuel cells, Gas generating systems), (*Gas generating systems, *Hydrogen), Design, Steam, Sulfur, Catalysts, Mobile, Military requirements, Flow charting.
Identifiers: Desulfurization.

A compact hydrogen generator for small liquid hydrocarbon fueled fuel cells was designed, built and partially tested. The basic generator embodies the steam reforming of liquid fuels available to the military. Provisions have been made for sulfur removal and hydrogen purification can be achieved with a palladium-silver hydrogen separator. Extensive testing on the reforming unit was conducted and results reported. An electronic control system for startup and steady state operation was designed and built but was not fully integrated with the reformer. Emphasis throughout the study was placed on miniaturizing components. (Author)

AD-767 624/0GA PC$3.50/MF$1.45
Gte Labs Inc Waltham Mass
LITHIUM BATTERY WITH INORGANIC ELECTROLYTE.
Final rept. 1 Dec 71-31 May 73,
James J. Auborn, Kenneth W. French, Adam Heller, and Sheldon Lieberman. Sep 73, 61p* Rept no. TR-73-845.1 ECOM-0060-F-72
Contract DAAB07-72-C-0060

Descriptors: (*Primary cells, Lithium), Chlorides, Phosphorus compounds, Sulfur compounds, Electrolytes, Cathodes, Compatibility, Oxychlorides, Lithium compounds, Electrical conductance.
Identifiers: High energy batteries, Phosphoryl chloride, Thionyl chloride, Thiophosphoryl chloride, *Lithium cells.

A series of lithium anode electrochemical cells using inorganic oxyhalides as solvents for the electrolytic solutions have been operated at room temperature. Lithium metal can be electrodeposited from these solutions accompanied by the simultaneous electrogeneration of chlorine at the positive electrode. The resulting lithium/chlorine electrochemical cell has an open circuit voltage in excess of 4 volts. A group of halogen/platinum, halogen/graphite, nonmetallic and metallic cathode systems are described. The solvents themselves, while stable to lithium metal and strong oxidants such as chlorine, can be electrochemically reduced at various catalytic surfaces (such as carbon) and act as cathode depolarizers. This electrochemical reduction of the solvent results in cells with extremely stable voltages and high-energy densities in excess of 500 Wh/kg.

CONF-730328-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
STATE-OF-THE-ART OF ENERGY CONVERSION: TODAY AND TOMORROW.
C. C. Burwell. 1973, 18p

Descriptors: Aluminium, Economics, Electricity, Energy conversion, Energy resources, Environment, Fossil fuels, Production.

For abstract, see NSA 28 02, number 04949.

LA-5142/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
OXIDATION BEHAVIOR OF TRANSIT CAPSULE T-47.
J. R. Morgan, and S. E. Bronisz. Apr 73, 12p
Contract W-7405-eng-36

Descriptors: (*Radioisotope heat sources, Capsules), (*Capsules, *Oxidation), Failures, Reentry, Safety.

For abstract, see NSA 28 03, number 05855.

MDC G-3156/GA PC$5.45/MF$1.45
Mcdonnell Douglas Astronautics CO., Richland, Wash. Donald W. Douglas Labs.
PLUTONIA/CURIA COMPATIBILITY TESTING. QUARTERLY REPORT NO. 16, JULY--SEPTEMBER 1972.
J. D. Watrous. Jan 73, 60p
Contract AT(45-1)-2138

Descriptors: (*Radioisotope heat sources, *Testing), (*Plutonium oxides, *Stability), (*Curium oxides, Stability), (*Tantalum alloys, Stability), Capsules, Cermets, Chemical reactions, Curium 242, Helium, Metallography, Molybdenum alloys, Plutonium 238, Rhenium alloys, Temperature dependence, Thermoelectric generators, Time dependence, Titanium, Tungsten alloys, Volatility, Zirconium.

For abstract, see NSA 28 03, number 05858.

MDC G-4403/GA PC$4.00/MF$1.45
Mcdonnell Douglas Astronautics CO., Richland, Wash. Donald W. Douglas Labs.
PLUTONIA/CURIA COMPATIBILITY TESTING. QUARTERLY REPORT NO. 17, OCTOBER--DECEMBER 1972.
J. D. Watrous. Mar 73, 32p
Contract AT(45-1)-2138

Descriptors: (*Radioisotope heat sources, *Testing), (*Thermoelectric generators, Radioisotope heat sources), (*Plutonium oxides, *Stability), (*Rhenium alloys, *Mechanical properties), Capsules, Chemical reactions, Curium oxides, Curium 244, Ductility, Elongation, Erosion, Graphite, Hafnium alloys, Iridium, Metallography, Plutonium 238, Temperature dependence, Time dependence, Titanium alloys.

For abstract, see NSA 28 03, number 05859.

MLM-1885/GA PC$3.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
DESIGN AND CONSTRUCTION OF A NUCLEAR POWERED MILLIWATT GENERATOR.
J. H. Birden, K. C. Jordan, and M. L. Miller. 6 Apr 73, 30p
Contract AT(33-1)-Gen-53

Descriptors: (*Plutonium 238, Thermoelectric generators), (*Thermoelectric generators, *Design), Fabrication.

For abstract, see NSA 28 02, number 02484.

MLM-2040/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
MOUND LABORATORY ISOTOPIC POWER FUELS PROGRAMS: JANUARY--MARCH 1973.
30 Apr 73, 32p
Contract AT-33-1-Gen-53

Descriptors: (*Radioisotope heat sources, *Research programs), (*Capsules, *Testing), (*Plutonium 238, Radioisotope heat sources), (*Plutonium oxides, *Fabrication), Casting, Compacting, Defects, Dies, Inspection, Iridium, Lasers, Materials drilling, Solubility, Temperature dependence.

For abstract, see NSA 28 03, number 05860.

N-72-29034/GA PC$5.45/MF$1.45
Gulf General Atomic, Inc., San Diego, Calif.
STUDIES OF THERMIONIC MATERIALS FOR SPACE POWER APPLICATIONS. SUMMARY REPORT, 1 AUGUST 1969--7 DECEMBER 1970.
20 Jul 71, 110p NASA-CR-72947, GULF-GA-11035
Contract NAS3-8504

Descriptors: (*Thermionic converters, *Performance), (*Space vehicles, *Power supplies), (*Thermocouples, *Fabrication).

For abstract, see NSA 28 02, number 02485.

N-73-10745/GA PC$4.00/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
STUDY OF RADIOISOTOPE SAFETY DEVICES FOR ELECTRIC PROPULSION SYSTEM. VOLUME I. SUMMARY REPORT.
G. B. Bradshaw, W. G. Homeyer, F. D. Postula, and E. J. Steeger. 6 Oct 72, 25p NASA-CR-114505, GULF-GA-A-12242(Vol.I)
Contract NAS2-5891

Descriptors: (*Thermionic converters, *Design), (*Space vehicles, *Propulsion), Safety.

For abstract, see NSA 28 02, number 02486.

N-73-11044/GA PC$4.00/MF$1.45
Jet Propulsion Lab., Pasadena, Calif.
DEVELOPMENT OF LITHIUM-DOPED RADIATION RESISTANT SOLAR CELLS.
P. A. Berman. 15 Nov 72, 25p NASA-CR-129183, JPL-TR-32-1574
Contract NAS7-100

Descriptors: (*Solar cells, *Radiation hardening), Crystal doping, Fabrication, Lithium, Physical radiation effects.

For abstract, see NSA 28 02, number 02761.

N-73-11045/GA PC$4.00/MF$1.45
Radio Corp. Of America, Princeton, N. J. Astro-Electronics Div.
REVISED SOLAR ARRAY SYNTHESIS COMPUTER PROGRAM. FINAL REPORT.
1 Feb 70, 45p NASA-CR-130109

Descriptors: (*Solar cells, *Performance), Charged particles, Computer codes, Physical radiation effects, Satellites, Temperature dependence.

For abstract, see NSA 28 02, number 02487.

NYO-3605-4/GA PC$7.25/MF$1.45
Tyco Labs., Inc., Waltham, Mass.
THEORETICAL-DENSITY INTEGRALLY-BONDED THERMOELEMENTS. SUMMARY REPORT, SEPTEMBER 1, 1965--AUGUST 31, 1966.
N. Hemmat, and M. Weinstein. 1966, 104p
Contract AT(30-1)-3605

Descriptors: (*Thermocouples, *Fabrication), Compacting, Density, Lead compounds, Tellurides, Thermoelectric generators, Tin compounds, Ultrasonic waves.

For abstract, see NSA 28 02, number 02488.

N73-27576/0GA PC$7.50/MF$1.45
Gulf General Atomic, San Diego, Calif.
FABRICATION AND LIFE TESTING OF THERMIONIC CONVERTERS.
Final Report.
L. Yang, and R. Bruce. Jun 73, 109p NASA-CR-121180, GULF-GA-A12554
Contract NAS3-12980

Descriptors: *Performance tests, *Service life, *Thermionic converters, Cladding, High temperature research, Systems engineering, Tungsten.

For abstract, see STAR 1118

N73-27928/3GA PC$3.25/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
FUEL CELL ION-EXCHANGE MEMBRANE INVESTIGATION.
Final Technical Report, 1 Mar. - 31 Aug. 1972.
M. S. Toy. 31 Oct 72, 22p NASA-CR-121007
Contracts NAS3-15577, SRI PROJ. 1771

Descriptors: *Failure analysis, *Fluorocarbons, *Ion exchange membrane electrolytes, Hydrogen oxygen fuel cells, Polymers, Sulfur compounds.

For abstract, see STAR 1119

ORNL-EIS-73-52(Vol.1)(No.4)/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
NSF-RANN ENERGY ABSTRACTS. A MONTHLY ABSTRACT JOURNAL OF ENERGY RESEARCH.
M. P. Guthrie. Apr 73, 35p
Contract W-7405-eng-26

Descriptors: (*Energy, *Bibliographies), Economics, Electric power, Energy consumption, Energy sources, Energy transmission, Environment, Legal aspects, Meetings, Power transmission, Proceedings.

For abstract, see NSA 28 02, number 04951.

ORNL-TM-4009/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
ISOTOPE KILOWATT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING SEPTEMBER 30, 1972.
Feb 73, 18p
Contract W-7405-eng-26

Descriptors: (*Direct energy converters, *Research programs), (*Thermoelectric generators, *Performance testing), (*Thermal insulation, Performance testing), (*Capsules, Performance testing), Biphenyl, Chemical radiation effects, Decomposition, Heat pipes, Phenyl ether, Radioisotope heat sources, Rankine cycle, Thermal conductivity.

For abstract, see NSA 28 03, number 05439.

ORNL-TM-4012/GA PC$5.00/MF$1.45
Oak Ridge National Lab., Tenn.
TEST OF A COMBINED HEAT PIPE--THERMOELECTRIC MODULE.
D. B. Lloyd. Apr 73, 56p
Contract W-7405-eng-26

Descriptors: (*Thermoelectric generators, *Performance testing), (*Heat pipes, Performance testing), (*Strontium 90, Thermoelectric generators), Thermal efficiency.

For abstract, see NSA 28 02, number 02489.

ORNL-TM-4129/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
ISOTOPE KILOWATT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1972.
A. P. Fraas, and G. Samuels. May 73, 25p
Contract W-7405-eng-26

Descriptors: (*Direct energy converters, *Research programs), (*Thermoelectric generators, *Heat pipes), (*Thermal insulation, *Performance testing), (*Capsules, Performance testing), Biphenyl, Chemical radiation effects, Decomposition, Phenyl ether, Pumps, Radioisotope heat sources, Rankine cycle, Thermal conductivity.

For abstract, see NSA 28 03, number 05440.

ORNL-4857/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ORNL ISOTOPIC POWER FUELS QUARTERLY REPORT FOR PERIOD ENDING DECEMBER 31, 1972.
E. Lamb. Mar 73, 13p
Contract W-7405-eng-26

Descriptors: (*Radioisotope heat sources, *Research programs), (*Curium oxides, *Chemical reactions), Capsules, Chromium alloys, Cobalt alloys, Curium 244, Hastelloys, Haynes 25 alloy, Helium, Inspection, Mass transfer, Metallography, Nickel, Nickel alloys, Performance testing, Stability, Welding.

For abstract, see NSA 28 03, number 05862.

ORNL-4890/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
ORNL ISOTOPIC POWER FUELS QUARTERLY REPORT FOR PERIOD ENDING MARCH 31, 1973.
E. Lamb. May 73, 12p
Contract W-7405-eng-26

Descriptors: (*Radioisotope heat sources, *Research programs), (*Curium oxides, *Chemical preparation), Annealing, Capsules, Chemical reactions, Curium 244, Hastelloys, Haynes alloys, Hot pressing, Impact tests, Impurities, Iridium, Leak testing, Performance testing, Physical properties, Platinum, Platinum alloys, Rhenium alloys, Rhodium alloys, Solubility, Stability, Tantalum, Tungsten.

For abstract, see NSA 28 03, number 05863.

PATENT-3 738 873/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
SELF GENERATING THERMOELECTRIC CONVERTER.
Patent,
Le Conte Cathey. Filed 23 Dec 64, patented 12 Jun 73, 3p PAT-APPL-420 840
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Radioisotope thermoelectric devices, *Patents), Thermoelectric generators, Radioisotope heat sources, Semiconductors(Materials), Thermoelectric materials.
Identifiers: PAT-CL-136-202.

The patent describes a single body semiconductor made of a radioactive element having a radioactive isotope heat source of the same element as an integral part thereof. The semiconductor is a compound including radioactive actinide element, such as plutonium, uranium or thorium, and the heat source is a heat-producing radioactive isotope of the same element. Suitable doping impurities, diffused into part of the semiconductor bar, shift the electrical potential distribution across the center portion to produce the thermoelectric element.

UCID-16112/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
LOSSES DUE TO IONIZATION AND CHARGE EXCHANGE IN THE CHANNEL OF THE DIRECT CONVERTER.
W. L. Barr. 30 Aug 72, 9p
Contract W-7405-eng-48

Descriptors: (*Direct energy converters, *Energy losses), Charge exchange, Efficiency, Electrons, Gases, Molecules, Secondary emission.

For abstract, see NSA 28 03, number 05441.

WANL-PR-953074-14/GA PC$6.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Astronuclear Lab.
STUDY OF THE COLLECTOR/HEAT PIPE COOLED EXTERNALLY CONFIGURED THERMIONIC DIODE. FINAL REPORT.
6 Mar 73, 83p

Descriptors: (*Thermionic converters, *Design), (*Heat pipes, Design), Fabrication, Performance testing.

For abstract, see NSA 28 03, number 05442.

10C. Energy Storage

LIB/Trans-437/GA PC$3.00/MF$1.45
POTENTIAL PERFORMANCE OF A TRITIUM-POWERED ISOTOPIC BATTERY.
M. Voinov, and H. Tannenberger. 1972, 20p
CONF-720519-5
Translated by K.G. McLaren (Australian Atomic Energy Commission Research Establishment, Lucas Heights) from French. U.S. Sales Only.

Descriptors: (*Radioisotope batteries, *Performance), Decay, Dielectric materials, Electric potential, Electric power, Electrons, Energy conversion, Mathematical models, Thickness, Tritium.

For abstract, see NSA 28 03, number 05856.

LIB/Trans-438/GA PC$4.00/MF$1.45
PROSPECTS FOR RADIOVOLTAIC ENERGY CONVERSION.
R. Bomal, A. Manin, and K. Steinschaden. 1972, 39p CONF-720519-4
Translated by K.G. McLaren (Australian Atomic Energy Commission Research Establishment, Lucas Heights) from French . U.S. Sales Only.

Descriptors: (*Radioisotope batteries, *Performance), Cadmium compounds, Cost, Direct energy conversion, Efficiency, Electric power, Optimization, Planning, Research programs, Semiconductor junctions, Silicon, Tellurides, Titanium hydrides, Tritium.

For abstract, see NSA 28 03, number 05857.

N73-27049/8GA PC$11.75/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
INORGANIC SEPARATOR TECHNOLOGY PROGRAM.
Final Report, Dec. 1970 - Nov. 1972.
J. S. Smatko, R. D. Weaver, and F. R. Kalhammer. Jan 73, 192p NASA-CR-121215, SRI-SCU-1377

Descriptors: *Inorganic materials, *Service life, *Silver zinc batteries, Failure analysis, Performance tests, Separators.

For abstract, see STAR 1118

PATENT-3 700 999/GA Not available NTIS
Office of the Secretary of the Army Washington D C
AUTOMATIC BATTERY POLARIZING CIRCUIT.
Patent,
Stanley J. Gourse. Filed 11 Jan 72, patented 24 Oct 72, 5p Rept nos. PAT-APPL-216 935,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Batteries + components, *Patents), Polarization, Electric bridges, Transistors.
Identifiers: *Battery depolarizers, PAT-CL-320-26.

The patent describes an automatic battery polarizing circuit employing transistors in the arms of a bridge circuit configuration. The transistors are operative to couple a battery connected to the input of the circuit in a manner that the bridge output voltage will always be of the same polarity regardless of how the battery is connected to the bridge input with respect to polarity.

11. MATERIALS

11A. Adhesives and Seals

AECL-4432/GA PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
PERFORMANCE ANALYSIS OF AXISYMMETRIC FLAT FACE MECHANICAL SEALS.
R. Metcalfe. Feb 73, 14p
U.S. Sales Only.

Descriptors: (*Seals, *Performance), Configuration, Hydrostatics, Lubrication.

For abstract, see NSA 28 03, number 07651.

N73-27415/1GA PC$8.25/MF$1.45
Pratt and Whitney Aircraft, East Hartford, Conn.
DEVELOPMENT OF MAINSHAFT SEALS FOR ADVANCED AIR BREATHING PROPULSION SYSTEMS.
Final Report, 7 Jul. 1971 - 6 Feb. 1973.
L. J. Dobek. Mar 73, 123p NASA-CR-121177, PWA-TM-4683
Contract NAS3-15346

Descriptors: *Air locks, *Gas turbines, *Packings (Seals), *Shafts (Machine elements), Equipment specifications, Performance tests, Product development.

For abstract, see STAR 1118

11B. Ceramics, Refractories, and Glasses

AD-767 065/6GA PC$3.00/MF$1.45
Massachusetts Univ Amherst School of Engineering
EFFECT OF POLYMERIC COATINGS ON STRENGTH OF SODA-LIME GLASS,
John E. Ritter, Jr. Jul 73, 27p* Rept no. UM-73-6
Contract N00014-68-A-0146

Descriptors: (*Glass, *Corrosion inhibition), (*Plastic coatings, Glass), Acrylic resins, Epoxy plastics, Silicone plastics, Fracture(Mechanics), Fatigue(Mechanics), Stress corrosion, Friction, Numerical analysis.
Identifiers: Fracture strength, Loads(Forces).

The effectiveness of polymeric coatings (acrylic, epoxy, and silicone) in preventing stress corrosion was determined by measuring the loading rate sensitivity of bend strength for coated, abraded and acid-polished soda-lime glass. The coatings were found to limit the availability of water to the glass surface and, thereby, cause an increase in the strength of abraded glass. The coatings also significantly improved the mechanical abrasion resistance of the acid-polished glass. However, the coatings did not eliminate the stress corrosion reaction between water and the glass surface and, hence, did not affect the sensitivity of glass strength to loading rate. During the testing program, it became evident that significant friction can arise during the bending test due to the supports 'digging' into the coatings. Therefore, the differential equations governing beam deflection in four-point bending were solved to include frictional forces between the test samples and the supports. The results of the bending analysis showed that frictional forces become significant at large deflections and can cause an increase in the observed strength. (Author)

AD-767 502/8GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
THE PLANAR DISTRIBUTION OF GRAIN SIZE IN A POLYCRYSTALLINE CERAMIC,
T. B. Langdon, and D. A. Aboav. 19 Oct 72, 8p
AFOSR-TR-73-1660
Contract F44620-71-C-0067
Prepared in cooperation with unnamed company in Charleywood (England).
Availability: Pub. in Metallography, v6 p9-15 1973.

Descriptors: (*Magnesium oxides, Grain size), Ceramic materials.

The planar distribution of grain size in polycrystalline magnesium oxide is accurately represented, over a wide range of average grain diameter, by a simple function of the square root of the grain diameter. An analysis of the experimental data shows that a similar function of the logarithm of the grain diameter does not fit them so well. (Author)

COM-73-50771/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MEASUREMENT OF THE HEAT CAPACITY OF GRAPHITE IN THE RANGE 1500 TO 3000 K BY A PULSE HEATING METHOD.
Final rept.,
A. Cezairliyan. 1973, 7p
Pub. in Proceedings of Symposium on Thermophysical Properties (6th), Palm Springs, Calif. Aug 73, p279-285.

Descriptors: (*Graphite, Specific heat), Pulse heating, Thermodynamic properties.

Measurement of the heat capacity of a grade of graphite (AXM-5Q, POCO) in the temperature range of 1500 to 3000 K by a subsecond-duration, pulse-heating technique is described. The smoothed results for a single specimen corresponding to two different heating rates are in agreement within 0.1% on the average. The smoothed results for two different specimens are in agreement within 0.6%. The heat capacity is expressed as a function of temperature.

COM-73-50806/1GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inorganic Materials Div.
INVESTIGATION OF VISCOUS FLOW IN GLASS DURING PHASE SEPARATION.
Annual rept. no. 1, Nov 72-Jun 73,
Joseph H. Simmons, Susan A. Mills, Albert Napolitano, Douglas H. Blackburn, and Wolfgang K. Haller. Sep 73, 44p NBS-TN-792
Contract NAonr-12-73
Paper copy available from GPO $0.65 as C13.46:792.

Descriptors: (*Borosilicate glass, *Viscosity), Microstructure, Phase transformations, Electron miscroscopy, Diffusion, Activation energy, Viscous flow.

The isothermal viscosity of two borosilicate glasses, of which one is a commercial glass widely used for chemical glassware, shows a large increase (4 to 5 orders of magnitude) with heat-treatment time (ranging up to 100,000 min) near the annealing point. The two glasses have similar compositions, but differ greatly in their phase separation characteristics. Electron micrographs are used to analyze the development of microstructure during the suspected phase separation. In both glasses, it is found that the structure development is primarily responsible for the viscosity increase. An analysis of the data, and a theoretical interpretation of the effect are presented. (Author)

CONF-730601-3/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
PREPARATION AND CHARACTERIZATION OF PYROLYTIC CARBON SEALANTS FOR GRAPHITE IN POWER REACTORS.
C. B. Pollock, and W. H. Cook. 7p

Descriptors: (*Graphite, *Permeability), (*Pyrolitic carbon, *Deposition), Layers, Neutrons, Physical radiation effects, Porosity, Production, Propylene, Pyrolysis, Sealing materials, Seals, Surface coating.

For abstract, see NSA 28 02, number 03019.

CONF-730601-5/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
IRRADIATION OF GRAPHITE AT 950 EXP 0 C.
C. R. Kennedy. 7p

Descriptors: (*Graphite, *Physical radiation effects), Hfir reactor, Shear, Stability, Stresses, Swelling, Temperature dependence, Very high temperature.

For abstract, see NSA 28 02, number 03021.

CONF-730601-6/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
DEVELOPMENT OF THERMAL SHOCK RESISTANT GRAPHITE.
C. R. Kennedy, and W. P. Eatherly. 6p

Descriptors: (*Graphite, *Stability), Coke, Heat treatments, Research programs, Thermal shock.

For abstract, see NSA 28 02, number 03022.

COO-3420-2/GA PC$3.50/MF$1.45
Pennsylvania State Univ., University Park. Dept. Of Materials Science.
CERAMIC RESEARCH ON TRANSFORMATIONAL SUPERPLASTICITY AND STOICHIOMETRIC EFFECTS ON FRACTURE. PROGRESS REPORT, JUNE 1, 1972--MAY 31, 1973.
R. C. Bradt, and J. H. Hoke. 1 Mar 73, 29p
Contract AT(11-1)-3420

Descriptors: (*Bismuth oxides, *Plasticity), (*Samarium oxides, Plasticity), High temperature, Phase transformations, Porosity, Strains, Stresses, Young modulus, Eutectoids.

For abstract, see NSA 28 02, number 03023.

KFK-1753/GA PC$9.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
CREEP BEHAVIOR OF POLYCRYSTALLINE ALUMINUM OXIDE AND AL SUB 2 O SUB 3 /CR CERMETS.
G. Engelhardt. Jan 73, 148p
In German. U.S. Sales Only.

Descriptors: (*Aluminium oxides, *Creep), (*Chromium alloys, Creep), Activation energy, Deformation, Polycrystals, Strains, Variations, Very high temperature, Cermets.

For abstract, see NSA 28 02, number 05041.

LBL-1403/GA PC$8.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
DIFFUSION AND PHASE RELATIONSHIP STUDIES IN THE ALUMINA--SILICA SYSTEM.
I. A. Aksay. Apr 73, 125p
Contract W-7405-eng-48

Descriptors: (*Aluminium oxides, *Phase diagrams), (*Silicon oxides, Phase diagrams), Diffusion.

For abstract, see NSA 28 03, number 07737.

N73-28590/0GA PC$9.50/MF$1.45
Battelle Columbus Labs., Ohio.
THERMOPHYSICAL PROPERTIES OF PLASMA SPRAYED COATINGS.
K. E. Wilkes, and J. F. Lagedrost. Mar 73, 148p
NASA-CR-121144
Contract NAS3-13329

Descriptors: *Composite materials, *Heat shielding, *Plasma spraying, *Thermal conductivity, *Thermophysical properties, Materials tests, Metal matrix composites, Product development.

For abstract, see STAR 1119

N73-28591/8GA PC$3.00/MF$1.45
Grumman Aerospace Corp., Bethpage, N.Y.
DEVELOPMENT OF A CLOSED PORE INSULATION MATERIAL.
A. Tobin, C. Feldman, M. Russak, and J. Reichman. Jul 73, 180p NASA-CR-2254
Contract NAS1-10713

Descriptors: *Foams, *Heat shielding, *Low density materials, *Space shuttles, Ceramics, Composite materials, Heat transfer, Thermodynamic properties.

For abstract, see STAR 1119

ORNL-4842/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
DEVELOPMENT OF RADIATION-RESISTANT INSULATORS. FINAL PROJECT REPORT, JULY 1, 1966 TO JANUARY 15, 1972.
W. W. Parkinson, and M. J. Kelly. Feb 73, 107p
Contract W-7405-eng-26

Descriptors: (*Quartz, *Physical radiation effects), (*Glass, Physical radiation effects), (*Ceramics, Physical radiation effects), (*Refractories, Physical radiation effects), Condenser ionization chambers, Dielectric materials, Electric conductivity, Gamma radiation, Polymers, Radiation hardening, Research programs, Temperature dependence.

For abstract, see NSA 28 02, number 02762.

PATENT-3 740 340/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
COMPOSITE INSULATORS FOR USE IN HOT HYDROGEN ENVIRONMENTS.
Patent,
Robert E. Riley, and James M. Taub. Filed 3 Mar 71, patented 19 Jun 73, 7p PAT-APPL-83 572
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, *Thermal insulation), (*Zirconium carbides, Thermal insulation), (*Zirconium oxides, Thermal insulation), Hafnium carbide, Hafnium oxide, Uranium oxide, Niokium carbide, Thermal conductivity, Hydrogen.

Identifiers: PAT-CL-252-311.1R.

The patent describes high temperature insulators comprising composites of the composition MC--M'O2 where M and M' may be Ti, Zr, Hf, V, Nb, Ta, Th, and U, and the metal carbide content may readily range from approximately 25 to 75 volume percent, have low thermal conductivities and adequate structural properties when maintained at temperatures as high as 2300C. for as long as 16 hours in a flowing hydrogen environment. The designation MC--M'O2 is a general one and does not necessarily imply a stoichiometric monocarbide and/or dioxide. (Author)

SLA-73-164/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
LOW STRESS SHOCK BEHAVIOR OF CELLULAR CONCRETE.
L. M. Lee. Feb 73, 24p

Descriptors: (*Concretes, *Compression strength), Compacting, Crystallization, Impact shock, Stresses, Time dependence.

For abstract, see NSA 28 02, number 03323.

SLA-73-499/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
DYNAMIC FRACTURE TOUGHNESS OF CARBON--CARBON COMPOSITES.
W. R. Hoover, and T. R. Guess. Apr 73, 26p

Descriptors: (*Carbon, *Fracture properties), (*Graphite, Fracture properties), (*Composite materials, Fracture properties), Charpy test, Cracks, Critical velocity, Filaments, Impact shock, Reinforced materials, Substrates.

For abstract, see NSA 28 03, number 06385.

TM-62-1-7/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
ELECTRON MICROSCOPY OF SOL PARTICLES.
R. C. Rau. Jan 62, 15p
Contract AT(40-1)-2847

Descriptors: (*Uranium dioxide, Sols), (*Aluminium oxides, Sols), (*Zirconium oxides, Sols), (*Sols, *Electron microscopy), Microstructure, Particles.

For abstract, see NSA 28 02, number 03046.

11C. Coating, Colorants, and Finishes

BDX-613-713(Rev.)/GA PC$3.25/MF$1.45
Bendix Corp., Kansas City, Mo.
SURFACE ENERGETICS OF CONFORMAL COATING LEVELING.
L. C. Jackson. Apr 73, 21p
Contract AT(29-1)-613

Descriptors: (*Wires, *Surface coating), Distribution, Thickness.

For abstract, see NSA 28 02, number 04997.

BDX-613-865/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
GOLD PLATING.-FINAL REPORT.
C. J. Stimetz. Mar 73, 17p
Contract AT(29-1)-613

Descriptors: (*Gold, *Electroplating), Cadmium, Cobalt, Contamination, Copper, Impurities, Iron, Microhardness, Nickel.

For abstract, see NSA 28 02, number 04998.

BDX-613-874/GA PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo.
ALUMINUM PLATING OF BERYLLIUM WIRE. TECHNOLOGICAL SPINOFF REPORT.
F. Clay. Mar 73, 15p
Contract AT(29-1)-613

Descriptors: (*Aluminium, *Deposition), (*Beryllium, *Surface coating), Fabrication, Plating, Wires.

For abstract, see NSA 28 02, number 03155.

N73-27450/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
PERFORMANCE CHARACTERISTICS OF ZINC-RICH COATINGS APPLIED TO CARBON STEEL.
W. J. Paton. Jul 73, 84p NASA-TN-D-7336

Descriptors: *Carbon steels, *Environmental tests, *Protective coatings, *Zinc, Cape kennedy launch complex, Corrosion, Performance tests.

For abstract, see STAR 1118

N73-27809/5GA PC$12.25/MF$1.45
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
FIELD REPAIR OF COATED COLUMBIUM THERMAL PROTECTION SYSTEM (TPS).
Final Report, Jun. 1970 - Oct. 1972.
J. D. Culp. 15 Sep 72, 204p NASA-CR-124295, MDC-E0681
Contract NAS8-26121

Descriptors: *Niobium, *Thermal protection, Ceramic coatings, Maintenance, Protective coatings, Reentry vehicles.

For abstract, see STAR 1118

PAT-APPL-687 594/GA PC$3.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
NOBLE METALS HAVING A HIGH EMITTANCE COATING OF IRON TITANATE.
Patent Application,
David F. Carroll. Filed 4 Dec 67, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Titanates, *Sprayed coatings), (*Patent applications, Sprayed coatings), Cladding, Thermal radiation, Spacecraft, Refractory metals, Refractory metal alloys, Precious metals, Platinum alloys, Rhodium containing alloys.
Identifiers: PAT-CL-117-105-2, Platinum alloy 10 Rh, Iron titanate.

The invention relates to a means to increase the total emittance of noble metals. It has been found that the application of a plasma arc sprayed coating of iron titanate on the surface of a noble metal increases the hemispherical emittance approximately 300%. The invention is comprised of a method to plasma arc spray the noble metals or intra-noble alloys thereof with a coating of iron titanate powder. This improves surface emittance of radioisotope containers for aerospace applications.

PATENT-3 687 701/GA Not available NTIS
Department of the Air Force Washington D C
THERMOPLASTIC RELEASE COATING.
Patent,
Theodore J. Reinhart, Jr. Filed 23 Nov 70, patented 29 Aug 72, 3p Rept nos. PAT-APPL-92 163,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Paints, Removal), (*Patents, *Paints), Aircraft, Metals, Epoxy plastics, Radomes.
Identifiers: PAT-CL-117-6, Paint removers.

The invention concerns a prime coat of thermoplastic release material that is applied to the metallic or thermosetting resin surface of an airplane or radome prior to coating the surface with an outer coat of thermosetting, resin-based paint. The thus interposed thermoplastic layer is useful in that it and the outer, thermosetting resin-based paint may be easily removed, at a later time, by the steps of (a) applying heat until the thermoplastic release material softens and (b) scraping or sanding.

PATENT-3 692 566/GA Not available NTIS
Office of the Secretary of the Army Washington D C
METHOD OF DEPOSITING ISOTROPIC BORON NITRIDE.
Patent,
Louis E. Branovich, William B. P. Fitzpatrick, and Martin L. Long, Jr. Filed 24 Nov 70, patented 19 Sep 72, 2p Rept nos. PAT-APPL-92 519,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Boron compounds, *Vapor plating), (*Patents, Vapor plating), Coatings, Ammonia, Graphite.
Identifiers: *Boron nitrides, Borazines, *Chemical vapor deposition.

Chemical vapor deposited isotropic boron nitride is formed on the inner walls of a reaction chamber by forming a vapor mixture of an oxygen containing organic boron compound with ammonia and reacting the vapor mixture in said reaction chamber at about 1100 degrees C. to about 1900 degrees C. at pressures of about one torr to atmospheric.

TID-26287/GA PC$3.25/MF$1.45
Washington State Univ., Pullman. Radioisotopes and Radiations Lab.
STUDY OF COATING DISTRIBUTION USING MICROTOME SECTIONING AND NEUTRON ACTIVATION ANALYSIS.
G. A. Grant, and G. S. Clifton. 13 Mar 73, 23p

Descriptors: (*Paper, Coatings), (*Coatings, *Distribution), Activation analysis, Diffusion, Neutrons, Titanium oxides.

For abstract, see NSA 28 02, number 02803.

Y-DA-5011/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
APPLICATIONS OF ION PLATING IN METALS FABRICATION.
R. T. Bell, and J. C. Thompson. 1973, 14p CONF-730325-1
Contract W-7405-eng-26

Descriptors: (*Tungsten carbides, *Surface coating), (*Uranium, Surface coating), (*Uranium alloys, Surface coating), Aluminium ions, Coatings, Copper ions, Deposition, Gold ions, Plating.

For abstract, see NSA 28 02, number 03160.

11D. Composite Materials

AD-767 046/6GA PC$3.50/MF$1.45
Massachusetts Univ Amherst School of Engineering
EXPERIMENTAL DETERMINATION OF STRAIN CONCENTRATIONS NEAR AN UNREINFORCED HOLE IN ORTHOTROPIC SHELLS.
Charles F. Scribner, and William A. Nash. Jul 73, 60p Rept no. UM-73-7
Contract N00014-68-A-0146-0016

Descriptors: (*Reinforced plastics, Stresses), (*Structural shells, Composite materials), Underwater vehicles, Loading(Mechanics), Epoxy plastics, Glass textiles, Strain(Mechanics), Mathematical models, Computer programs.
Identifiers: Openings, Cylindrical shells, Stress concentration, Computer aided analysis.

Research was conducted in the University of Massachusetts Structural Mechanics Laboratory to determine the character of stress concentrations around an unreinforced hole in cylindrical orthotropic shell sections. The report discusses construction and instrumentation of these sections with consideration of various systems of strain measurement, described the equipment used in tests, and discusses the data obtained from strain gages epoxied to the surface of three specimens. Qualitative conclusions are drawn relating the behavior of this material to the behavior of isotropic materials and a similar glass-reinforced material with different fiber orientation. (Author)

AD-767 221/5GA PC$7.00/MF$1.45
Avco Systems Div Wilmington Mass
EVALUATION OF TEST TECHNIQUES FOR ADVANCED COMPOSITE MATERIAL.
Technical rept. 10 Jul 67-31 May 70,
Edward M. Lenoe. Aug 71, 306p Rept no. AVSD-0354-71-RR AFML-TR-68-166-Pt-3
Contract F33615-67-C-1719
See also part 2 dated Dec 69, AD-699 586.

Descriptors: (*Composite materials, Test methods), (*Reinforced plastics, Test methods), Epoxy plastics, Boron, Tensile properties, Shear stresses, Flexural strength.
Identifiers: *Boron reinforced plastics, Epoxy matrix composites.

Tentative test methods are presented for evaluating the tension, flexure and shear behavior of boron epoxy composites. These methods are based upon fairly extensive studies of the influence of specimen geometry and experimental techniques. Non-destructive evaluation procedures are also discussed. Limited information is included concerning the thermal expansion response of nominal 50 volume percent boron laminates. Comparisons are made of data obtained using sandwich beam and cylinder experiments and coupon test specimens. A special cylinder test fixture was used wherein the ends of the thin walled tubes were restrained with a rubber bladder in order to minimize speciman end restraint effects. The report also includes a discussion of the adequacy of the recommended test methods for other advanced composite systems. (Author)

AD-767 267/8GA PC$3.00/MF$1.45
Fiber Materials Inc Biddeford Maine
FABRICATION OF ALUMINUM-GRAPHITE COMPOSITES.
Final rept. May 72-May 73,
Roger T. Pepper, Robert A. Penty, and Stephen J. Allen. Jul 73, 50p AMMRC-CTR-73-25
Contract DAAG46-72-C-0180

Descriptors: (*Composite materials, Aluminum alloys), (*Hot pressing, Composite materials), Carbon fibers, Wire, Mechanical properties, Microstructure.
Identifiers: Fiber composites, Aluminum matrix composites, Graphite reinforced composites.

Aluminum-graphite composites have high potential for use in weight critical structures requiring materials of high strength and stiffness to density ratio. Aluminum and graphite are potentially cheap raw materials, and aluminum-graphite composites offer the attractive prospect of low cost. A continuous liquid metal infiltration process has recently been developed for making composite wire from commercially available multifiber graphite yarns. Composite wire has been made from Thornel 50 infiltrated with A13, 220 and 6061 alloys. Aluminum alloy-graphite composite shapes have been successfully fabricated by hot-pressing

the composite wire. Mechanical testing of both the composite wire and hot-pressed bars includes longitudinal and transverse tensile, flexural and compressive strengths and elastic modulus. The longitudinal tensile strength and elastic modulus of both the composite wire and hot-pressed bars approximated rule of mixtures behavior. Examination of the microstructure indicates that better transverse strength may be achieved through refinement of the matrix grain size, elimination of continuous networks of intermetallic compounds, and homogenization of the alloy constituents of the matrix. (Modified author abstract)

AD-767 642/2GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
SOLUTION GRAPHS: SIMPLE ALGEBRAIC STRUCTURES FOR PROBLEMS IN LINEAR ANISOTROPIC ELASTICITY.
Final rept.,
P. W. Mast. 18 Sep 73, 32p Rept no. NRL-7577

Descriptors: (*Composite materials, Elasticity), Graphics, Anisotropy, Reinforced plastics, Tensor analysis.
Identifiers: *Graph theory, Directed graphs.

The use of directed graphs to explicitly state the structure of solutions in plane linear anisotropic elasticity aids research into the strength and failure of composite materials by providing a visible structure for: recording available solutions, adding on new solutions, and selecting useful solutions for the problem of finding functions on the composite structure whose critical values are load and geometry invariant. Further aid is given by recent developments in tensor manipulations in complex coordinates, the mechanics of which are included as an appendix. The solution graphs (directed graphs) for the anisotropic half plane and for the contact of dissimilar anisotropic half planes are presented. (Author)

COM-73-50776/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
METAL-FILLED RESIN COMPOSITES.
Final rept.,
R. L. Bowen, and H. H. Chandler. 1973, 11p
Sponsored in part by American Dental Association, Chicago, Ill.
Pub. in Jnl. of Dental Research, v52 n3 p522-532 May/Jun 73.

Descriptors: (*Polymers, *Metal particle composites), Physical properties, Surface finishing, Aluminum, Gold, Tantalum, Zirconium, Methacrylates, Thiols, Filled thermoplastics.

Certain physical properties of metal-filled resin composite materials can be improved if properly selected and applied coupling agents are used in treating the surfaces of the metal particles.

LA-5136/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
MC.M'O SUB 2 COMPOSITES: A NEW THERMAL INSULATOR.
R. E. Riley, and J. M. Taub. Feb 73, 18p
Contract W-7405-eng-36

Descriptors: (*Transition element compounds, *Composite materials), (*Actinide compounds, Composite materials), (*Oxycarbides, Composite materials), Physical properties, Reinforced materials, Thermal insulation, Very high temperature.

For abstract, see NSA 28 03, number 06136.

LA-5140-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
IMPROVED THERMAL-SHOCK-RESISTANT CARBIDES.
R. E. Riley, and J. M. Taub. Feb 73, 7p
Contract W-7405-eng-36

Descriptors: (*Tantalum carbides, *Composite materials), (*Tantalum, Composite materials), Cracks, Filaments, Reinforced materials, Thermal stresses, Wires.

For abstract, see NSA 28 03, number 06137.

LA-5233-PR/GA PC$3.50/MF$1.45
Los Alamos Scientific Lab., N. Mex.
RESEARCH ON CARBON AND GRAPHITE. QUARTERLY PROGRESS REPORT, OCTOBER 1--DECEMBER 31, 1972.
R. J. Imprescia, R. D. Resiwig, J. M. Williams, and R. E. Honnell. Mar 73, 28p
Contract W-7405-eng-36

Descriptors: (*Titanium carbides, *Dispersions), (*Zirconium carbides, Dispersions), (*Vanadium carbides, Dispersions), (*Tantalum carbides, Dispersions), Binders, Carbon, Coal tar, Composite materials, Graphite, Impregnation, Pyrolysis, Resins.

For abstract, see NSA 28 02, number 03322.

N73-27784/0GA PC$6.75/MF$1.45
Materials Sciences Corp., Blue Bell, Pa.
AN INVESTIGATION OF THE COMPRESSIVE STRENGTH OF PRD-49-3/EPOXY COMPOSITES.
Final Report.
S. V. Kulkarni, J. S. Rice, and B. W. Rosen. Jun 73, 93p NASA-CR-112334
Contract NAS1-11780

Descriptors: *Composite materials, *Compressive strength, *Fiber orientation, *Synthetic fibers, Construction materials, Mechanical properties, Physical properties, Product development.

For abstract, see STAR 1118

N73-27786/5GA PC$7.00/MF$1.45
Princeton Univ., N.J. Dept. of Aerospace and Mechanical Sciences.
THEORETICAL ANALYSIS OF IMPACT IN COMPOSITE PLATES.
F. C. Moon. 1973, 100p NASA-CR-121110, AMS-1099
Contract NAS3-14331

Descriptors: *Composite materials, *Impact tests, *Stress analysis, Displacement, Fourier transformation, Stress concentration, Stress waves.

For abstract, see STAR 1118

PATENT-3 723 214/GA Not available NTIS
Department of the Navy Washington D C
METHOD OF MAKING A STEEL, GRAPHITE, PHENOLIC ASBESTOS LAMINATE.
Patent,
Daniel Meraz, Jr. Filed 1 Mar 71, patented 27 Mar 73, 3p Rept nos. PAT-APPL-119 949,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Laminates, *Patents), (*Rocket motor nozzles, Laminates), Heat-resistant materials, Steel, Graphite, Asbestos, Epoxy plastics, Phenolic plastics, Manufacturing methods, Adhesives.
Identifiers: PAT-CL-156-87.

The patent describes a high temperature laminate and method of fabrication consisting essentially of consecutive layers of steel, graphite and phenolic asbestos held together by a self-supporting adhesive film. The laminate is useful in the manufacture of rocket nozzles which withstand temperatures of 6,000F. and above.

SC-RR-720924/GA PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ELASTIC-PLASTIC POISSON'S RATIO OF BORSIC-REINFORCED ALUMINUM COMPOSITES.
R. E. Allred. Dec 72, 40p

Descriptors: (*Composite materials, *Elasticity), (*Aluminium alloys, Elasticity), (*Boron, Elasticity), (*Silicon carbides, Elasticity), Plasticity, Poisson ratio, Reinforced materials.

For abstract, see NSA 28 03, number 06139.

SLA-73-208/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
STRUCTURES, PROPERTIES, AND PROCESS PARAMETERS OF MATRICES IN CARBON/CARBON COMPOSITES.
H. O. Pierson, M. L. Lieberman, and J. F. Smatana. Mar 73, 30p

Descriptors: (*Carbon, *Microstructure), Acetylene, Benzene, Composite materials, Fibers, Gases, Matrix materials, Physical properties, Production, Reinforced materials, Vapor deposited coatings.

For abstract, see NSA 28 02, number 03324.

UCRL-74396/GA PC$4.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
STRESS--RUPTURE OF STRANDS OF AN ORGANIC FIBER/EPOXY MATRIX.
T. T. Chiao, J. E. Wells, R. L. Moore, and M. A. Hamstad. 1 Mar 73, 36p CONF-730331-1

Descriptors: (*Filaments, *Ruptures), (*Organic compounds, Ruptures), (*Epoxides, *Matrix materials), Composite materials, Distribution functions, Stresses.

For abstract, see NSA 28 03, number 07809.

11E. Fibers and Textiles

COM-73-11359/9GA PC$3.50/MF$1.45
Tesoro (Giuliana C.), Dobbs Ferry, N.Y.
STATUS AND PROSPECTS FOR FLAME RESISTANT POLYESTER/CELLULOSE BLEND FABRICS.
Final rept. Oct 72-Mar 73,
Giuliana C. Tesoro. 15 Mar 73, 56p* NBS-GCR-73-16
Contract C-3-35813

Descriptors: (*Cotton fabrics, Flammability), (*Fire resistant coatings, Cotton fabrics), Polyester fibers, Rayon, Phosphorus, Treatment.

The report describes the status of flame retardant (FR) finished polyester/cotton and polyester/rayon blend fabrics. While these fabrics represent a large part of the present market, there exists presently no commercial FR treatment for them, though such treatments are available for 100% cellulose and 100% polyester fabrics. Self-extinguishing behavior can be attained by insolubilizing sufficient phosphorus on the blends, and the amount of phosphorus needed is lowered by the presence of bromine. Phosphorus in the form of phosphine oxide, derived from treatment with tetrakis-hydroxymethyl phosphonium derivatives, has been shown to be more effective than phosphonate or phosphoramine phosphorus. The amount of finish necessary to obtain self-extinguishing behavior, however, tends to stiffen the fabric and raises its cost. Suggestions are made for further research in this area.

N73-27502/6GA PC$4.00/MF$1.45
United Aircraft Corp., East Hartford, Conn. Research Labs.
DEVELOPMENT OF LARGE DIAMETER CARBON MONOFILAMENT.
Contractor Report, Jun. 1972 - Jan. 1973.
B. Jacob, and R. D. Neltri. Jan 73, 40p NASA-CR-121229

Contract NAS3-15842

Descriptors: *Boron, *Carbon fibers, *Vapor deposition, Chemical reactions, Hydrogen, Methane.

For abstract, see STAR 1118

11F. Metallurgy and Metallography

AD-767 064/9GA PC$3.75/MF$1.45
Battelle Columbus Labs Ohio
PART-THROUGH-CRACK BEHAVIOR IN THREE THICKNESSES OF MILL-ANNEALED TI-6AL-4V PLATE.
Final rept.,
Charles E. Feddersen, Theodore L. Porfilio, Richard C. Rice, and Walter S. Hyler. 31 Dec 72, 94p
Contract N61169-72-C-0036

Descriptors: (*Titanium alloys, Fracture(Mechanics)), Fatigue(Mechanics), Crack propagation, Microstructure, Tensile properties, Metal plates.
Identifiers: Titanium alloy 6Al 4V, Fracture strength.

Part-through crack behavior has been evaluated in one quarter, one half and one-inch thicknesses of mill-annealed Ti-6Al-4V plate. Constant-amplitude fatigue-crack propagation, overload-crack retardation, near-fracture crack extension, and critical fracture or residual strength were the four aspects of crack behavior considered. The near-fracture crack extension studies demonstrate that over the finite range of thickness considered, the region of critical crack instability occurs at the extremes of the crack length dimension, rather than at the depth as postulated by classical elastic concepts. This supports the representation of fracture data by a semiempirical approach outlined herein. In general, it appeared that toughness can be characterized by simple formulations of the stress-intensity factor, excluding the back surface correction. However, the back surface correction was a necessary transformation to achieve a smooth transition of fatigue-crack-propagation behavior during breakthrough of the back surface. (Modified author abstract)

AD-767 117/5GA Reprint
Pennsylvania Univ Philadelphia Dept of Metallurgy and Materials Science
THE CYCLIC STRESS STRAIN RESPONSE OF METALS AND ALLOYS.
Technical rept.,
Carmen Calabrese, and Campbell Laird. Apr 73, 11p
Grant DA-ARO-D-31-124-72-G29
Availability: Pub in the Proceedings of the International Conference on Fracture (3rd) n.d. p1-8. Paper V-231.

Descriptors: (*Aluminum alloys, *Fatigue(Mechanics)), Strain hardening, Copper alloys, Microstructure, Stresses.
Identifiers: Stress cycle, Fatigue life, Transmission electron microscopy.

The cyclic hardening and softening of a pure Al-4% Cu alloy, heat-treated so as to contain various precipitate structures, has been studied by conventional plastic strain controlled tests and transmission electron microscopy. Microstructures containing small ordered precipitates were found to harden initially and subsequently to soften by a disordering mechanism. Microstructures containing larger precipitates, impenetrable to dislocations, hardened slightly by the accumulation of geometrically necessary dislocations but did not soften. The implications of these results for a wide range of two phase materials are discussed. (Author)

AD-767 152/2GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Metallurgy and Materials Science
THERMODYNAMICS OF AUSTENITIC FE-C ALLOYS,
Shiro Ban-Ya, John F. Elliott, and John Chipman. 6 Oct 69, 11p AROD-6513:4-MC
Contract DAHC04-67-C-0036
Availability: Pub. in Metallurgical Transactions, v1 p1313-1320 May 70.

Descriptors: (*Iron alloys, *Thermodynamics), Austenite, Graphite, Carbon dioxide, Carbon monoxide, Heat of activation, Carbon, Steel.
Identifiers: Cementite.

New data on the activity of carbon in austenite have been obtained by CO2/CO equilibration of Fe-C alloys in the temperature range 900 to 1400C. Equations for the thermodynamic properties of carbon and iron in austenite are obtained from the data combined with selected data from the literature. A slightly modified phase diagram is presented. The stability of cementite is also determined from data published earlier and the results of the present study. Parameters of the various models of the behavior of carbon in austenite taken from the literature are also calculated from the data. (Author)

AD-767 155/5GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Metallurgy and Materials Science
SOLID PHASES OF THE MN-C SYSTEM,
Robert Benz, John F. Elliott, and John Chipman. 18 Aug 72, 7p AROD-6513:12-MC
Contract DAHC04-67-C-0036
Availability: Pub. in Metallurgical Transactions, v4 p1449-1452 Jun 73.

Descriptors: (*Manganese alloys, *Phase diagrams), (*Carbon alloys, Phase diagrams), Crystal structure, Manganese compounds, Carbon compounds.
Identifiers: Lattice parameters.

The Mn-C system between 700 and 1110C was reexamined by microscopic and X-ray diffraction methods. The results summarized in a phase diagram show cubic alpha-, beta-, gamma-Mn, and hexagonal epsilon existing over appreciable ranges of composition, and cubic Mn23C6, hexagonal Mn15C4, orthorhombic Mn3C, monoclinic Mn5C2, and hexagonal (or trigonal) Mn7C3 as essentially line compounds. Room temperature lattice parameters of the quenched hexagonal epsilon - Mn4C(1+X) phase was found. (Modified author abstract)

AD-767 170/4GA Reprint
California Univ San Diego La Jolla Dept of Physics
THERMAL DECOMPOSITON OF PRCO2 AND NDCO2 UNDER ULTRA-HIGH VACUUM,
P. D. Farmar, and A. C. Lawson. 27 Mar 73, 4p
AFOSR-TR-73-1614
Contract F44620-72-C-0017
Availability: Pub. in Physics Letters, v44A n1 p1-2, 7 May 73.

Descriptors: (*Praseodymium compounds, Pyrolysis), (*Neodymium compounds, Pyrolysis), (*Cobalt alloys, *Pyrolysis), Rare earth compounds, Intermetallic compounds, Rare earth elements, Vacuum.
Identifiers: Ultrahigh vacuum, Cobalt intermetallics, Rare earth alloys.

The authors report that under conditions of high temperature and ultra-high vacuum the phases PrCo2 and NdCo2 decompose with the reaction of RECo2 to RECo3 + RE (RE = rare earth element). (Modified author abstract)

AD-767 177/9GA Reprint
Naval Research Lab Washington D C
NOTCH TOUGHNESS OF AUSTENITIC STAINLESS STEEL WELDMENTS WITH NUCLEAR IRRADIATION,
J. R. Hawthorne, and H. E. Watson. 1973, 6p
Availability: Pub. in Welding Jnl. Research Supplement, p1-6 Jun 73.

Descriptors: (*Welds, Stainless steel), (*Stainless steel, Notch toughness), Radiation damage, Neutron reactions, Liquid metal cooled reactors, Breeder reactors, Reactor materials.
Identifiers: Weldments, Steel 308, Steel 304, Steel 316.

The pre- and postirradiation notch toughness of austenitic stainless steel plates and weld deposits was explored to aid materials selection and application for liquid metal fast breeder (LMFBR) reactors. The study encompassed six plates (AISI Types 304, 316, 304L, 316L), two submerged arc weld deposits (Types 308 and 316), and one shielded metal-arc weld deposit (Type 308). Dynamic tear (DT) and Charpy-V(Cv) test methods were employed to determine notch toughness trends. (Modified author abstract)

AD-767 226/4GA PC$3.00/MF$1.45
Panametrics Inc Waltham Mass
DEVELOPMENT OF A SELF-CONTAINED PORTABLE UNIT FOR NONDESTRUCTIVE COMPOSITIONAL ANALYSIS OF AIRCRAFT AND SPACE SYSTEMS ALLOYS.
Final technical rept. 1 Jul 71-31 Mar 73,
Joris M. Brinkerhoff. Jul 73, 34p AFML-TR-73-181
Contract F33615-71-C-1897

Descriptors: (*Alloys, X-ray spectroscopy), X-ray filters, Design, Aircraft, Portable, Non-destructive testing.
Identifiers: *X ray spectrometers, X ray fluorescence, Computed aided analysis.

Two portable radioisotope excited X-ray fluorescence systems have been designed and delivered, one a high resolution type using a cryogenically cooled solid state detector and the other a gas filled proportional counter operated in conjunction with balanced x-ray filters. The measurement probes were designed for sample areas that may be of small size or that may occur in recessed locations. Measurement techniques were formulated and studied that use pure elemental standards in conjunction with just a single alloy reference for a given unknown. Computational programs were written to implement these techniques. A set of twenty-seven analyzed reference alloys was also provided. This report summarizes the design aspects of the two systems and the course of evaluation of the measurement techniques. (Author)

AD-767 227/2GA PC$4.50/MF$1.45
Rohr Industries Inc Chula Vista Calif
DEVELOPMENT OF A FILLER METAL AND JOINING PROCESS FOR TITANIUM-ALLOY HONEYCOMB PANELS.
Final rept. Jul 71-May 73,
J. R. Woodward. Jul 73, 143p AFML-TR-73-125
Contract F33615-71-C-1888

Descriptors: (*Titanium alloys, *Sandwich construction), (*Honeycomb cores, Titanium alloys), (*Joining, Titanium alloys), Heat treatment, Foils, Brazing alloys, Hydrogen, Copper alloys, Tin alloys, Silver alloys, Manufacturing methods, Electroplating, Failure(Mechanics), Adhesives, Tensile properties, Compressive properties, Fatigue(Mechanics), Corrosion, Oxidation, Costs, Shear stresses.
Identifiers: Titanium alloy 3Al 6Cr 4Mo 8V 4Zr, Titanium alloy 3Al 1Fe 8Mo 8V, Titanium alloy 6Al 4V, Metal sheets, Peel strength, Fabrication.

The second generation beta titanium alloys, Beta III, RMI 38-6-44 and TMCA 88-23, were furnished in foil and fabricated into honeycomb core. All

three alloys responded well to the core manufacturing process. Thermal effect studies showed that all of the beta titanium alloys were relatively unaffected by high temperature, long time exposures when in foil form. Sheet forms resulted in grain growth under the same conditions. The Rohr Industries, Inc. proprietary LID(TM) bonding process showed the highest strength joints of all other systems tested. Sandwich panels made with the three beta titanium cores bonded to Ti 6Al 4V faces were measured in all sandwich test modes. The data were compared with sandwich structure made with the same joining system except with Ti 3Al 2.5V core. Results showed that significant strength improvements can be realized by using beta titanium core. Projections also show that material cost economies may be realized by using beta titanium core. (Author)

AD-767 270/2GA PC$12.75/MF$1.45
California Univ Berkeley Lawrence Berkeley Lab
AN INVESTIGATION OF METALLURGICAL FACTORS WHICH AFFECT FRACTURE TOUGHNESS OF ULTRA-HIGH STRENGTH STEELS.
Final rept. 26 Jun-26 Dec 72,
William E. Wood, Earl R. Parker, and Victor F. Zackay. May 73, 213p Rept no. LBL-1474
AMMRC-CTR-73-24
Contracts DAAG46-72-C-0220, W-7405-eng-48

Descriptors: (*Steel, *Fracture(Mechanics)), Toughness, Heat treatment, Microstructure, Martensite, Embrittlement.
Identifiers: High strength steels, Fracture properties, Steel 4130, Steel 4140, Steel 4330, Steel 4340, Steel 300-M.

The relationship between microstructure, heat treatment and room temperature fracture toughness has been determined for the low alloy ultra-high strength steels 4130, 4330, 4340, 4140 and 300-M. Optical metallography, microprobe analysis, and scanning electron microscopy were used to characterize the structure and morphology, while both Charpy V-notch impact tests and plane strain fracture toughness tests were used to determine the fracture properties. The normal commercial heat treatment resulted in the formation of some bainite in all the alloys. MnS inclusions on prior austenite grain boundaries were found to initiate cracks during loading. By increasing the austenitizing temperature to 1200C, the fracture toughness could be increased by at least 60%. For some alloys increasing the severity of the quench in conjunction with the higher austenitizing temperatures resulted in further increases in the fracture toughness, and the elimination of any observable upper bainite. There was no correlation between the Charpy impact test results and the fracture toughness results. (Modified author abstract)

AD-767 304/9GA PC$4.25/MF$1.45
Massachusetts Inst of Tech Cambridge Casting and Solidification Section
HIGH STRENGTH ALUMINUM ALLOYS PREPARED BY IMPROVED SOLIDIFICATION TECHNIQUES.
Final technical rept., 1 Nov 71-31 Oct 72,
Robert Mehrabian, Diran Apelian, Rodney G. Riek, Min-Hsiug Tsai, and Merton C. Flemings. Jun 73, 105p*
Contract DAAG25-72-C-0171

Descriptors: (*Aluminum alloys, *Casting), Permeability, Filters(Fluid), Design, Cermets, Defects(Materials), Silicon alloys, Iron alloys, Titanium alloys, Microstructure, Alumina, Boron alloys, Impurities, Titanium compounds, Borides, Silicon carbides, Composite materials, Intermetallic compounds.
Identifiers: Aluminum alloy 1B 5Si, Aluminum alloy 4Si, Aluminum alloy 1Ti, Aluminum 2Fe 5Si, Titanium boride, Solification.

The research is presented in three parts. (1) Filtration of Aluminum Alloys - The effectiveness of various filter media in removing oxide particles and synthetic inclusions such as TiB2 from aluminum alloys was investigated. Results showed that by proper choice of filters, particles of different sizes can be effectively filtered from aluminum alloys. Pressures required for metal flow through the smallest pore filters were less than 60 psi. (2) Specific Permeability of Partially Solidified Dendritic Networks of Al-Si Alloys - Segregated interdendritic liquid was successfully removed from partially solidified Al-Si alloys. Porous columnar, equiaxed and grain refined dendritic networks of the alloys were prepared. Specific permeabilities of the porous dendritic networks were measured using a triaxial cell permeameter. For equivalent volume fraction solid, the permeabilities of the grain refined samples were found to be lower than those of the non-grain refined samples. Flow through the partially solid non-grain refined samples obeyed D'Arcy's law. (3) Casting of Aluminum Alloy - Particulate Ceramic Composites - A new process for the preparation and casting of metal-ceramic composites is described. Particulate composite end chill plates containing Al2O3, SiC or glass beads in an Al-Si-Fe alloy matrix were successfully prepared. These plates exhibited good abrasion resistance and improved hardness. (Author)

AD-767 307/2GA PC$2.75/MF$1.45
Naval Research Lab Washington D C
SUSTAINED-LOAD CRACKING OF TITANIUM: A SURVEY OF 6AL-4V ALLOYS.
Final rept.,
G. R. Yoder, C. A. Griffis, and T. W. Crooker. 24 Aug 73, 25p* Rept no. NRL-7596

Descriptors: (*Titanium alloys, *Fracture(Mechanics)), Crack propagation, Loading(Mechanics), Anisotropy, Hydrogen.
Identifiers: Titanium alloy 6Al 4V, Fracture strength.

This survey reveals that degradation in load-carrying capacity owing to sustained-load cracking (SLC) is widespread and serious in alloys of the Ti-6Al-4V family. Each of eight different one inch (2.5-cm) thick plates tested in air at room temperature exhibited the effect, with degradations ranging up to 35%. The amount of degradation does not seem to correlate with differences in hydrogen content, processing variables, or strength and toughness levels; however, the susceptibility to SLC is orientation dependent. Invalidity of several of the rising-load fracture toughness values, with respect to plane-strain criteria, makes quantitative comparison of degradations uncertain. However, the threshold stress-intensity factor below which SLC failures will not occur, KIt, clearly represents a more conservative fracture-safe design parameter than the plane-strain fracture toughness KIc, which cannot account for insidious time-delayed failures owing to SLC. (Author)

AD-767 326/2GA PC$3.50/MF$1.45
National Bureau of Standards Washington D C Inst for Materials Research
THE ROLE OF PASSIVE FILM GROWTH KINETICS AND PROPERTIES IN STRESS CORROSION AND CREVICE CORROSION SUSCEPTIBILITY.
Technical summary rept. no. 4,
J. Kruger, and J. R. Ambrose. Jul 73, 75p Rept no. NBSIR-73-244
Contract NAonr-18-69

Descriptors: (*Stress corrosion, Films), (*Stainless steel, Stress corrosion), (*Titanium alloys, Stress corrosion), pH, Cracks, Chlorides, Nitrates, Reaction kinetics.
Identifiers: *Stress corrosion resistance, Passivity, Polarimetry, Steel 304, Titanium alloy 8Al 1Mo 1V, Dissolved gases.

The early stages of crevice corrosion of AISI 304 stainless steel in 1.ON NaCl solution have been detected using the ellipsometer to measure changes in optical properties occurring within the crevice between a polished metal surface and a glass plate. Changes in the ellipsometer parameters begin almost immediately upon creation of the crevice and can be interpreted as resulting from a build-up of soluble species within the crevice solution, followed by an overall thinning of the protective film and general corrosion attack. Such optical changes could not be reproduced by deoxygenation of the bulk solution without the presence of a crevice nor were they observed during experiments using a Ti-8Al-1Mo-1V alloy, which is not susceptible to crevice corrosion in the 1.ON NaCl at room temperature. (Author)

AD-767 390/8GA PC$3.50/MF$1.45
Maryland Univ College Park Engineering Materials Group
THE STRENGTHENING, OR WEAKENING, OF POLYCRYSTALS DUE TO THE PRESENCE OF GRAIN BOUNDARIES.
Technical rept.,
Ronald W. Armstrong. Aug 73, 72p* Rept nos. EMG-132, TR-11
Contract N00014-67-A-0239-0011

Descriptors: (*Grain boundaries, Metals), (*Fracture(Mechanics), Grain boundaries), Fatigue(Mechanics), Creep, Deformation, Dislocations, Twinning(Crystallography), Hardness, Microstructure, Reviews.
Identifiers: Polycrystals, Fracture strength, Plasticity.

The grain boundaries which are present within a polycrystalline aggregate frequently contribute to strengthening the material because they provide a definite resistance to slip bands or twin bands that otherwise would propagate freely through the microstructure. Experimental and theoretical analyses which bear on this general subject are reviewed in this report. Particular attention is given to the following items: The application of the Hall-Petch relation to a variety of microstructures and to providing an assessment of the complete stress-strain behavior; The experimental and theoretical application of the stress-grain size analysis to specifying the brittle fracture stress, even for pre-cracked specimens, and to describing the ductile-brittle transition behavior of various materials; and, The dependence on grain size of the hardness, creep, and fatigue properties of several metals and alloys, especially, as these properties are related to the conventional stress-strain behavior of these same materials. (Modified author abstract)

AD-767 508/5GA Reprint
Battelle Columbus Labs Ohio
PHYSICS OF TITANIUM ALLOYS. I. ALLOYING AND MICROSTRUCTURAL EFFECTS IN THE SUPERCONDUCTIVITY OF TI-MO,
J. C. Ho, and E. W. Collings. 1973, 17p AFOSR-TR-73-1753
Contract F33615-69-C-1594, Grant AF-AFOSR-2084-71
Availability: Pub. in Titanium Science and Technology, v2 p815-830 1973. (Plenum Publ. Corp., N.Y.).

Descriptors: (*Titanium alloys, *Superconductivity), Molybdenum alloys, Transition temperature, Microstructure, Phase studies.

In this, the first of a pair of papers reviewing some of the physical properties of Ti alloys, the conjoint influences of solute concentration and microstructural state on the superconducting transition temperature of Ti-Mo are discussed. (Author)

AD-767 532/5GA PC$3.00/MF$1.45
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate

RAPID HEATING AND LOADING OF 250- AND 300-GRADE MARAGING STEEL.
Technical rept.,
John H. Honeycutt. Aug 73, 32p Rept no. RL-73-5

Descriptors: (*Maraging steels, Tensile properties), Heating, Temperature, Strain(Mechanics).
Identifiers: Steel 4Co 9Ni.

The purpose of this report is to make available to the design engineer tensile property date on 250- and 300-grade maraging steel, in the longitudinal direction, under conditions of rapid heating and loading. The tensile property data reported are: ultimate tensile stress, ultimate yield stress (at 0.2-percent offset), elastic modulus, percent total elongation, and percent uniform elongation. These tensile properties were determined at a strain rate of 0.005 in./in./sec and at temperatures of 78 (RT), 250, 500, 750, 1000, and 1250F. The time required to reach test temperature was, in most cases, less than 10 seconds. Primary consideration is given to ultimate tensile and yield properties. Other tensile property data reported are secondary and should be used for design criteria only after consideration has been given to the methods used for obtaining and reducing these data.

AD-767 551/5GA PC$2.75/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
DETERMINATION OF BASIC STRENGTH PROPERTIES OF TI-8MO-8V-2FE-3AL SHEET.
Technical rept.,
Charles H. Curll, and Peter Lum. Jun 73, 16p*
Rept no. AMMRC-PTR-73-7

Descriptors: (*Titanium alloys, Mechanical properties), Tensile properties, Compressive properties, Test equipment, Heat treatment.
Identifiers: Titanium alloy 3Al 2Fe 8Mo 8V, Metal sheets.

Examination of the various room temperature mechanical properties of the beta-alloy Ti-8Mo-8V-2Fe-3Al sheet (Ti-8823) in the stabilized heat-treated condition indicates that this material may represent a cost-effective replacement for millannealed Ti-6Al-4V sheet (Ti-64). With approximately equal elastic moduli the strength properties are higher for the stabilized Ti-8823 than for the mill-annealed Ti-64. The examination also indicates that for improved strength properties of solutionized, cold-rolled and aged Ti-8823, either a greater amount of cold working or longer aging time is probably needed. ASTM Standards E-9 and E-238 cite typical sheet specimens and fixtures for compression and bearing testing, but do not cite any standard specimens or fixtures. Therefore, in this study the development of a compression and hearing test fixture compatible with the null-balance, servo-measuring system inherent in the test equipment was required. (Author)

AD-767 597/8GA PC$3.50/MF$1.45
Boeing Commercial Airplane Co Seattle Wash
EVALUATION OF AFC 77 MARTENSITIC STAINLESS STEEL FOR AIRFRAME STRUCTURAL APPLICATIONS.
Final technical rept. 1 Jun 71-31 May 73,
R. G. Caton, and C. S. Carter. Sep 73, 74p Rept no. D6-60225 AFML-TR-73-182
Contract F33615-71-C-1550

Descriptors: (*Stainless steel, Mechanical properties), (*Stress corrosion, Stainless steel), Fatigue(Mechanics), Fracture(Mechanics), Tensile properties, Heat treatment, Crack propagation, Airframes.
Identifiers: Martensitic stainless steels, Steel AFC 77, Steel AFC 77B, Fracture strength, Fatigue life.

The fabrication and properties of two high-strength stainless martensitic steel forgings are described. A high level of fracture toughness was achieved in the AFC 77 forging at a tensile strength level of 235 ksi. Stress corrosion resistance, however, was similar to that of competitive steels. The fracture toughness, stress corrosion, and fatigue properties developed in the AFC 77B forging at a tensile strength of 260 ksi were similar to those of currently used steels. Cracking problems were experienced with both forgings during heat treatment. The stress corrosion resistance of AFC 77 was no higher than that of competitive steels. The target tensile strength of 275 ksi was not achieved in the AFC 77B landing gear forging. A lower tensile strength would appear to be more appropriate for this alloy in heavy section form. The fracture toughness, stress corrosion, and notch fatigue properties were very similar to those of medium alloy steels. Although both AFC 77 and AFC 77B are stainless types of steel, it is considered that the low stress corrosion resistance would necessitate plating and painting to prevent the ingress of moisture. (Modified author abstract)

AD-767 614/1GA PC$4.25/MF$1.45
Northrop Corp Hawthorne Calif Aircraft Div
DEVELOPMENT AND EVALUATION OF METHODS OF PLANE STRESS FRACTURE ANALYSIS. PART I. REVIEW AND EVALUATION OF STRUCTURAL RESIDUAL STRENGTH PREDICTION TECHNIQUES.
Final rept. Jul 72-Feb 73,
Ralph M. Verette, and David P. Wilhem. May 73, 113p Rept no. NOR-72-32-Pt-1 AFFDL-TR-73-42
Contract F33615-72-C-1769

Descriptors: (*Fracture(Mechanics), *Airframes), (*Reviews, Fracture(Mechanics)), Crack propagation, Predictions, Metals, Stresses.
Identifiers: Fracture strength.

The treatment of residual strength prediction for aircraft structures having through flaws is considered in this report. A discussion of the circumstances which normally give rise to plane stress or mixed mode fracture is presented along with a summary of those elements which would constitute an 'ideal' residual strength method. This method would be capable of prescribing the remaining strength possessed by a broad variety of flawed aircraft structures under actual service environments. Currently available prediction techniques fall considerably short of the desired goal, and the strong and weak points of existing methods, as well as comparisons with test results, are presented. A recommended technique is described for residual strength prediction which bridges the gap between the existing methods and the ideal. The recommended approach will account for slow crack growth and plasticity. It appears that the apporach will utilize the J integral in combination with a modified form of the crack gorwth resistance curve in making residual strength predictions. (Author)

AECL-4139/GA PC$4.75/MF$1.45
Atomic Energy of Canada LTD., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
THERMODYNAMICS OF METAL--WATER SYSTEMS AT ELEVATED TEMPERATURES. PART 4. THE NICKEL--WATER SYSTEM.
D. D. Macdonald. Dec 72, 55p
U.S. Sales Only.

Descriptors: (*Nickel, *Corrosion), (*Water, *Corrosive effects), Electric potential, High temperature, Mass transfer, Medium temperature, Nickel oxides, Ph value, Solubility, Temperature dependence, Thermodynamic properties.

For abstract, see NSA 28 02, number 03129.

AECL-4352/GA PC$4.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
WEAR OF 304 SS VERSUS WAUKESHA-88 IN WATER: DESIGN EQUATIONS AND GRAECO-LATIN SQUARE ANALYSIS.
V. S Cecco, and P. L. Ko. Feb 73, 40p
U.S. Sales Only.

Descriptors: (*Stainless steel-304, *Water), (*Nickel base alloys, Water), (*Journal bearings, *Testing), Design, Equations, Losses, Numerical solution, Wear, Weight.

For abstract, see NSA 28 03, number 07650.

BNWL-SA-4668/GA PC$5.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
STRESS CORROSION IN NUCLEAR SYSTEMS.
S. H. Bush, and R. L. Dillon. 8 Mar 73, 63p CONF-730605-2

Descriptors: (*Stainless steels, *Stress corrosion), (*Heat resisting alloys, Stress corrosion), (*Steels, Stress corrosion), (*Inconel alloys, Stress corrosion), Bwr type reactors, Pwr type reactors, Reactor materials, Reviews, Steam generators, Tubes.

For abstract, see NSA 28 03, number 06207.

CALT-822-48/GA PC$4.00/MF$1.45
California Inst. Of Tech., Pasadena. Div. Of Engineering.
STUDIES OF ALLOY STRUCTURES AND PROPERTIES. ANNUAL SUMMARY REPORT, 1 DECEMBER 1971--1 DECEMBER 1972.
31p
Contract AT(04-3)-822

Descriptors: (*Metals, *Research programs), (*Alloys, Research programs), Elements, Kondo effect, Mechanical properties, Nonmetals, Physical properties, Superconductivity.

For abstract, see NSA 28 02, number 03182.

CEA-CONF-2119/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
CONTRIBUTION TO THE STUDY OF THE STABILITY OF COLD-WORKED AUSTENITIC STEELS, PARTICULARLY DURING CREEP TESTS: INFLUENCE OF CARBON STABILIZING ELEMENTS.
J.-N. Calvet, P. Petrequin, M. Weisz, and A. Badard. 1972, 47p CONF-721063-5
In French. U.S. Sales Only.

Descriptors: (*Steels, *Stability), Austenite, Carbon additions, Cold working, Creep.

For abstract, see NSA 28 02, number 05006.

CEA-R-4414/GA PC$7.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDIES OF THE FRACTURING OF METALLIC SAMPLES SUBJECTED TO A PLANE SHOCK WAVE. SPALLING OF CU AND U.
F. David, J. Vacellier, F. Prouteau, and J. Legrand. Mar 73, 111p
In French. U.S. Sales Only.

Descriptors: (*Copper, *Cracks), (*Uranium base alloys, Cracks), (*Molybdenum alloys, Cracks), (*Vanadium alloys, Cracks), Dilute alloys, Fractures, Shock waves, Surfaces, Time dependence, Velocity.

For abstract, see NSA 28 02, number 03183.

COM-73-50770/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CHROMIUM-RHODIUM CONSTITUTION DIAGRAM.
Final rept.,
R. M. Waterstrat, and R. C. Manuszewski. 1973, 13p
Sponsored in part by American Dental Association, Chicago, Ill.
Pub. in Jnl. Less-Common Metals, v32 p331-343 1973.

Descriptors: (*Chromium alloys, *Phase diagrams), (*Rhodium alloys, Phase diagrams), Eutectics, Crystal structure, Intermetallics, Rhodium intermetallics, Solid phases.

The Cr-Rh alloy system has been studied over the entire composition range by metallography, X-ray diffraction and electron microprobe methods. There are two intermediate phases in this system. The epsilon phase has a hexagonal close-packed structure and is stable over a broad composition range from about 20 at .% Cr at 900C to 68 at .%Cr at 1475C. The beta phase possesses a Cr3Si(A15) type structure and is stable over a narrow composition range from about 77 to 78 at .%Cr. The location of the face-centered cubic (gamma Rh) to hexagonal close-packed (epsilon phase) transition is strongly temperature dependent. Precipitation of a metastable hexagonal close-packed structure occurs during rapid cooling of the body-centered cubic (alpha-Cr) solid solution. A peritectic reaction exists at 1700 plus or minus 10C, a eutectic reaction occurs at 1475 plus or minus 10C, and a peritectoid reaction is located at 1265 plus or minus 12C.

COM-73-50777/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CHROMIUM-PLATINUM CONSTITUTION DIAGRAM.
Final rept.,
R. M. Waterstrat. 1973, 8p
Sponsored in part by National Inst. of Dental Research, Bethesda, Md.
Pub. in Metallurgical Transactions, v4 p1585-1592 Jun 73.

Descriptors: (*Chromium alloys, *Phase diagrams), (*Platinum alloys, Phase diagrams), Eutectics, Crystal structure, Intermetallics, Platinum intermetallics, Solid phases.

The system Cr-Pt has been investigated over the entire composition range by metallography, X-ray diffraction, and electron microprobe studies. There is only one intermediate phase and it has a Cr3Si(A15)-type crystal structure. The fcc platinum terminal solid solution extends to 71 at. pct Cr at 1530C and forms a congruent melting maximum at about 1790C. Atomic ordering within this solid solution range begins at about 17 at. pct Cr and there is a continuous change from the Cu3Au-type structure to the CuAu-type structure with increasing chromium content. Two eutectic reactions at 1530C plus or minus 10C and at 1500C plus or minus 10C were indicated and there is evidence of a syntectic reaction at 1580C plus or minus 10C. Platinum is soluble in the bcc chromium terminal solid solution up to about 10 at. pct Pt at 1500C but the solubility decreases rapidly at lower temperatures.

COM-73-50778/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CHROMIUM-IRIDIUM CONSTITUTION DIAGRAM.
Final rept.,
R. M. Waterstrat, and R. C. Manuszewski. 1973, 11p
Sponsored in part by National Inst. of Dental Research, Bethesda, Md.
Pub. in Less-Common Metals, v32 p79-89 1973.

Descriptors: (*Chromium alloys, *Phase diagrams), (*Iridium alloys, Phase diagrams), Eutectics, Crystal structure, Intermetallics, Solid phases, Iridium intermetallics.

The Cr-Ir alloy system has been investigated over the entire composition range by metallography, X-ray diffraction and electron microprobe studies. There are two intermediate phases in this system. The beta phase possesses a Cr3Si (A15) -type crystal structure and is stable from about 73 to 82 at .% Cr. The epsilon phase has a hexagonal close-packed crystal structure and is stable between 30 and 68 at .% Cr. The face-centered cubic iridium terminal solid solution can dissolve about 28 at .% Cr. Atomic ordering occurs within this solid solution, beginning at about 16 at .% Cr and forming a Cu3Au type structure up to the limit of solid solubility. Iridium is soluble in the body-centered cubic chromium terminal solid solution to the extent of about 12 at .% Ir at 1680C but the solubility decreases at lower temperatures. Two peritectic reactions were observed at 1750 plus or minus 10C and at 2200 plus or minus 50C. A eutectic reaction is indicated at 1680 plus or minus 10C.

CONF-721010-72/GA PC$3.00/MF$1.45
Ghent Rijksuniversiteit (Belgium). Institutt voor Kernwetenschappen.
PRACTICAL ASPECTS OF NEUTRON ACTIVATION DETERMINATION OF THE PLATINUM METALS.
R. Gijbels, and A. Govaerts. 1972, 19p
U.S. Sales Only.

Descriptors: (*Iridium, *Activation analysis), (*Rocks, Activation analysis), (*Palladium, Activation analysis), (*Platinum, Activation analysis), Basalt, Coincidence methods, Gamma spectroscopy, Granites, Granodiorites, Ion exchange chromatography, Multi-element analysis, Multi-element separation, Neutron beams, Osmium, Quantitative chemical analysis, Sensitivity, Slags, Thermal neutrons.

For abstract, see NSA 28 02, number 02102.

CONF-721010-76/GA PC$3.00/MF$1.45
DETERMINATION OF TI, V, ZN, AND W USING PROTON ACTIVATION.
N. N. Krasnov, Yu. G. Sevast'yanov, I. O. Konstantinov, V. G. Vinogradova, and V. V. Malukhin. 1972, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Scandium, *Activation analysis), (*Titanium, Activation analysis), (*Vanadium, Activation analysis), (*Copper, Activation analysis), Gamma spectra, Mev range 10-100, Nuclear reactions, Proton beams, Sensitivity, Vanadium 48, Chromium 51, Gallium 66, Zinc, Rhenium 182, Tantalum, Tungsten.

For abstract, see NSA 28 02, number 02106.

CONF-721010-79/GA PC$3.00/MF$1.45
ACTIVATION ANALYSIS OF PURE MATERIALS USING SHORT HALF-LIFE ISOTOPES.
E. M. Lobanov, A. G. Dutov, and G. V. Leushkina. 1972, 18p
In Russian. U.S. Sales Only.

Descriptors: Accuracy, Activation analysis, Errors, Gamma spectroscopy, Minutes living radioisotopes, Neutron beams, Seconds living radioisotopes, Sensitivity, Thermal neutrons.

For abstract, see NSA 28 02, number 02108.

CONF-721010-80/GA PC$3.25/MF$1.45
INTERFERENCES IN THE DETERMINATION OF TRACE ELEMENTS IN HIGH-PURITY TIN.
W. Maenhaut, F. Adams, and J. Hoste. 1972, 24p
U.S. Sales Only.

Descriptors: (*Tin, *Activation analysis), (*Antimony, Activation analysis), (*Indium, Activation analysis), (*Cadmium, Activation analysis), Cross sections, Impurities, Interference, Neutron beams, Nuclear reactions, Quantitative chemical analysis, Resonance.

For abstract, see NSA 28 02, number 02109.

COO-1791-4/GA PC$4.25/MF$1.45
Michigan Univ., Ann Arbor.
THERMODYNAMIC PROPERTIES OF SOLID ALLOYS OF CHROMIUM WITH NICKEL AND IRON. FINAL REPORT.
F. N. Mazandarany, and R. D. Pehlke. 1972, 45p
Contract AT(11-1)-1791

Descriptors: (*Chromium alloys, *Thermodynamic properties), (*Nickel alloys, Thermodynamic properties), (*Iron alloys, Thermodynamic properties), Electrolytic cells, Oxides, Quantity ratio, Temperature dependence.

For abstract, see NSA 28 02, number 05015.

COO-3166-3/GA PC$6.25/MF$1.45
Cornell Univ., Ithaca, N. Y. Materials Science Center.
PERMEATION OF HYDROGEN THROUGH ANNEALED AND DEFORMED IRONS.
A. J. Kumnick. Aug 72, 82p

Descriptors: (*Hydrogen, *Diffusion), (*Iron, Diffusion), (*Iron alloys, Diffusion), Activation energy, Annealing, Deformation, Embrittlement, High temperature, Medium temperature, Permeability, Solubility.

For abstract, see NSA 28 02, number 03185.

COO-3166-5/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N. Y. Dept. Of Materials Science and Engineering.
ENVIRONMENT AND FRACTURE. PROGRESS REPORT.
H. H. Johnson. 7 Mar 73, 11p
Contract AT(11-1)-3166

Descriptors: (*Steels, *Cracks), (*Hydrogen, *Diffusion), Corrosion, Embrittlement, Fatigue, Medium temperature, Oxygen.

For abstract, see NSA 28 02, number 03130.

COO-3171-13/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N. Y. Dept. Of Materials Science and Engineering.
ELECTROMIGRATION STUDY OF VOID KINETICS IN METALS. ANNUAL PROGRESS REPORT.
P. S. Ho. Mar 73, 11p
Contract AT(11-1)-3171

Descriptors: (*Aluminium, *Physical radiation effects), (*Gold, Physical radiation effects), Dislocations, Electron beams, Electron microscopy, Voids, Helium ions.

For abstract, see NSA 28 02, number 03282.

EUR-4949/GA PC$4.25/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
MECHANICAL TESTING AND METALLURGICAL EXAMINATIONS OF PRESSURE TUBES MADE FROM ZR--2.5 % NB ALLOY, 92 X 98 MM DIAMETRE. EXTRUDED, QUENCHED, AND COLD REDUCED.
G. Beghi, and B. Henry. Apr 73, 44p
In Italian. U.S. Sales Only.

Descriptors: (*Zirconium base alloys, *Mechanical properties), (*Niobium alloys, Mechanical properties), (*Pressure tubes, *Testing), Cold working, Microstructure, Texture.

For abstract, see NSA 28 02, number 03186.

EURFNR-1028/GA PC$4.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
IN-PILE STRESS RUPTURE AND CREEP BEHAVIOR OF THE ALLOY INCOLOY 800.
K. D. Closs, and L. Schaefer. May 72, 20p KFK-1599

Descriptors: (*Incoloy 800, *Physical radiation effects), Aluminium additions, Carbon additions, Creep, High temperature, Ruptures, Stresses, Titanium additions, Very high temperature.

For abstract, see NSA 28 02, number 03187.

EURISOTOP-74/GA PC$6.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
USE OF ACTIVATION ANALYSIS BY GAMMA PHOTONS AND CHARGED PARTICLES TO DETERMINE THE OXYGEN CONTENT IN NONFERROUS METALS, PARTICULARLY IN AL, CU, PB, AND THEIR ALLOYS, TI, ZR, NB, MO, TA, NA, CS, SI, GE, AND SE.
Ch. Engelmann. 1973, 94p
U.S. Sales Only.

Descriptors: (*Activation analysis, *Reviews), (*Oxygen, Activation analysis), (*Aluminium, Activation analysis), (*Copper, Activation analysis), Cesium, Charged particles, Gamma radiation, Germanium, Lead, Molybdenum, Niobium, Photon beams, Quantitative chemical analysis, Selenium, Silicon, Sodium, Tantalum, Titanium, Zirconium.

For abstract, see NSA 28 02, number 02119.

FRNC-CONF-67/GA PC$3.00/MF$1.45
Aluminium Pechiney, Voreppe (France). Centre de Recherches.
MEASUREMENT OF THE THICKNESS OF OXIDE LAYERS BY IRRADIATION WITH 14 MEV NEUTRONS. CASE OF AL.
F. Dugain, and C. Michaut. 1972, 8p CONF-721010-9
In French. U.S. Sales Only.

Descriptors: (*Oxygen, *Activation analysis), (*Aluminium, Activation analysis), Accuracy, Comparative evaluations, Foils, Mev range 10-100, Neutron reactions, Sample preparation, Surfaces, Thickness.

For abstract, see NSA 28 03, number 05097.

FRNC-CONF-72/GA PC$4.00/MF$1.45
Centre National de la Recherche Scientifique, Nancy (France). Centre de Recherches Petrographiques et Geochimiques. Paris Univ., Orsay (France). Centre National de la Recherche Scientifique, Paris (France). Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
NEUTRON ACTIVATION ANALYSIS OF V, CR, HF, ZR, TL, RB, AND CS IN CLAYS, ZIRCONS, AND FELDSPARS.
H. Jaffrezic, A. Decarreau, J. P. Carbonnel, and N. Deschamps. 1972, 4p CONF-721069-7
In French. U.S. Sales Only.

Descriptors: (*Rubidium, *Activation analysis), (*Cesium, Activation analysis), (*Feldspars, Activation analysis), (*Thallium, Activation analysis), Gamma spectroscopy, Geochemistry, Neutron beams, Nondestructive analysis, Thermal neutrons, Radiochemistry, Solvent extraction, Hafnium, Zircon, Zirconium, Chromatography, Clays, Vanadium.

For abstract, see NSA 28 02, number 02121.

FRNC-CONF-77/GA PC$4.00/MF$1.45
Ecole Nationale Superieure des Mines, Saint-Etienne (France).
ACTIVATION ANALYSIS AT L'ECOLE DES MINES (SAINT-ETIENNE): APPLICATION TO THE STUDY OF VERY HIGH PURITY FE.
A. Lesbats, and M. R. Tardy. 1972, 8p CONF-721069-10
In French. U.S. Sales Only.

Descriptors: (*Iron, *Activation analysis), Accuracy, Impurities, Multi-element analysis, Multi-element separation, Neutron beams, Quantitative chemical analysis, Sensitivity, Thermal neutrons.

For abstract, see NSA 28 02, number 02122.

FRNC-TH-279/GA PC$5.25/MF$1.45
Toulouse Univ. (France).
CONTRIBUTION TO THE STUDY OF HF OXIDATION.
B. Pieraggi. 1971, 61p
In French. U.S. Sales Only.

Descriptors: (*Hafnium base alloys, *Oxidation), (*Copper alloys, Oxidation), (*Hafnium, Oxidation), Air, Bibliographies, Chemical reaction kinetics, Diffusion, Electron microscopy, Films, Hafnium oxides, Metallography, Optical microscopy, Oxygen.

For abstract, see NSA 28 02, number 03131.

HEDL-SA-508/GA PC$3.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
EFFECT OF IRRADIATION TEMPERATURE ON VOID FORMATION IN COLD WORKED TYPE 316 STAINLESS STEEL.
H. R. Brager, and J. L. Straalsund. Dec 72, 5p CONF-730611-2
Contract AT(45-1)-2170

Descriptors: (*Stainless steel-316, *Physical radiation effects), Cold working, Deformation, Fast reactors, Heat treatments, Microstructure, Reactor cores, Swelling, Temperature dependence, Uses, Voids.

For abstract, see NSA 28 03, number 06367.

INR-1424/GA PC$3.25/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
METASTABLE INTERMEDIATE PHASE IN THE SB--GE SYSTEM.
M. Chyczewski, and H. Matyja. 1972, 24p
In Polish. U.S. Sales Only.

Descriptors: (*Germanium alloys, *Phase diagrams), (*Antimony alloys, Phase diagrams), Activation energy, Cooling, Liquids, Solubility.

For abstract, see NSA 28 02, number 05026.

INR-1425/GA PC$3.25/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
METASTABLE INTERMEDIATE PHASES IN THE SB--ZN AND SB--CD SYSTEMS.
M. Chyczewski, and H. Matyja. 1972, 23p
In Polish. U.S. Sales Only.

Descriptors: (*Antimony alloys, *Phase diagrams), (*Zinc alloys, Phase diagrams), (*Cadmium alloys, Phase diagrams), Activation energy, Quenching.

For abstract, see NSA 28 02, number 03188.

INR-1426/GA PC$3.50/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
METASTABLE INTERMEDIATE PHASES IN THE SB WITH CR, FE, NI, AND IN THE TE WITH CO, FE, NI SYSTEMS.
M. Chyczewski, A. Calka, and H. Matyja. 1972, 30p
In Polish. U.S. Sales Only.

Descriptors: (*Iron alloys, *Phase diagrams), (*Nickel alloys, Phase diagrams), Activation energy, Liquids, Pyrolysis, Quenching, Solubility, Antimony alloys, Tellurium alloys, Cobalt alloys.

For abstract, see NSA 28 02, number 05027.

INR-1441/GA PC$4.00/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
METASTABLE INTERMEDIATE PHASES IN THE SB WITH AL, GA, IN, AND IN THE TE WITH ZN AND CD.
M. Chyczewski, W. Zielinska, and H. Matyja. 1972, 40p
In Polish. U.S. Sales Only.

Descriptors: (*Antimony alloys, *Phase diagrams), (*Indium alloys, Phase diagrams), (*Tellurium alloys, Phase diagrams), (*Cadmium alloys, Phase diagrams), Cooling, Liquids, Solubility, Aluminium alloys, Gallium alloys, Zinc alloys.

For abstract, see NSA 28 02, number 03189.

JEN-242/GA PC$4.50/MF$1.45
Junta de Energia Nuclear, Madrid (Spain).
PRODUCTION OF HYDROGEN AND HELIUM ATOMS IN NUCLEAR REACTOR MATERIALS OF CONSTRUCTION, BRITTLENESS OF AUSTENITIC STEELS AT HIGH TEMPERATURES.
J. L. Jimenez. 1972, 49p
In Spanish. U.S. Sales Only.

Descriptors: (*Stainless steel-304, *Physical radiation effects), (*Stainless steel-316, Physical radiation effects), (*Zircaloy, Physical radiation effects), (*Niobium, Physical radiation effects), Alpha particles, Binary alloy systems, Embrittlement, Helium, Hydrogen, Neutron beams, Nuclear reactions, P codes, Production, Protons, Thermal neutrons, Zorita-1 reactor, Titanium alloys, Vanadium base alloys.

For abstract, see NSA 28 02, number 03283.

KFK-1718/GA PC$6.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
INVESTIGATIONS OF THE REACTION BEHAVIOR OF VANADIUM BASE ALLOYS WITH SIMULATED FISSION PRODUCTS OF UO SUB 2 AND UC.
P. Hofmann, and P. Goetzmann. Jan 73, 77p
In German. U.S. Sales Only.

Descriptors: (*Vanadium base alloys, *Corrosion resistance), (*Titanium alloys, Corrosion resistance), (*Silicon additions, Corrosion resistance), (*Zirconium alloys, Corrosion resistance), Bromine, Cesium, Chemical reactions, Corrosive effects, Embrittlement, Fission products, Hardening, High temperature, Iodine, Selenium, Tellurium, Uranium carbides, Uranium dioxide, Very high temperature, Chromium alloys.

For abstract, see NSA 28 02, number 03132.

KFK-1773/GA PC$3.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
INFLUENCE OF COLD-WORKING ON THE CORROSION RESISTANCE OF AUSTENITIC CRNI-STEELS IN SUPERHEATED STEAM. 3. STATIC AUTOCLAVE STUDIES OF THE MATERIAL NO. 1.4301 (X5 CRNI 18 9).
S. Leistikow, E. Pott, and W. Volz. Mar 73, 31p
In German. U.S. Sales Only.

Descriptors: (*Stainless steel-304, *Cold working), (*Steam, *Corrosive effects), Annealing, Chromium oxides, Corrosion resistance, Defects, Diffusion, Distribution, Grain boundaries, Grain refinement, Grain size, High pressure, High temperature, Iron ions, Layers, Nickel ions, Oxygen ions, Spinels, Superheating, Very high temperature.

For abstract, see NSA 28 03, number 06210.

LBL-1174/GA PC$3.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
STRUCTURE AND PROPERTIES OF A NON-CARBON-CONTAINING BCC IRON ALLOY AT ROOM AND ELEVATED TEMPERATURES.
V. F. Zackay, E. R. Parker, and D. Bhandarkar. Oct 72, 23p CONF-721064-4
Contract W-7405-eng-48

Descriptors: (*Iron base alloys, *Mechanical properties), (*Tantalum alloys, Mechanical properties), (*Chromium alloys, Mechanical properties), Aging, Creep, Heat treatments, High temperature, Medium temperature, Molybdenum additions, Ruptures, Stresses, Yield strength.

For abstract, see NSA 28 02, number 03191.

N-72-32549/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EFFECT OF AGING AT 1040C ON DUCTILITY AND STRUCTURE OF A TANTALUM ALLOY, T-111.
G. K. Watson, and J. R. Stephens. Oct 72, 36p
NASA-TN-D-6988

Descriptors: (*Tantalum alloy-t111, *Mechanical properties), Aging, Crystal structure, Ductility, Embrittlement, Hafnium oxides, Sensitivity, Sheets, Tubes, Very high temperature.

For abstract, see NSA 28 02, number 03192.

N-73-12550/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
IRRADIATION EFFECTS ON 17-7 PH STAINLESS STEEL, A-201 CARBON STEEL, AND TI--6% AL--4% V ALLOY.
R. A. Hasse, and C. B. Hartley. Nov 72, 19p
NASA-TM-X-2678

Descriptors: (*Titanium base alloys, *Physical radiation effects), (*Aluminium alloys, Physical radiation effects), (*Vanadium alloys, Physical radiation effects), (*Carbon steels, Physical radiation effects), Fast neutrons, Mechanical properties, Neutron beams, Pbr reactor, Stainless steel-17-7ph.

For abstract, see NSA 28 02, number 03284.

NAA-SR-8617(Vol.2)/GA PC$8.50/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP TECHNOLOGY HANDBOOK. VOLUME II. HYDRIDE FUELS AND CLADDINGS.
G. F. Burdi. 15 Nov 64, 129p
Contract AT(11-1)-GEN-8

Descriptors: (*Hastelloys, *Physical properties), (*Rene 41, Physical properties), (*Td-nickel, Physical properties), (*Alloy-tzm, Physical properties), Fuel elements, Nuclear fuels, S2ds reactor, S8er reactor, Yttrium hydrides, Zirconium hydrides.

For abstract, see NSA 28 03, number 06138.

N73-27447/4GA PC$3.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
TENSILE DEFORMATION AND FRACTURE IN HIGH STRENGTH AL-ZN-MG ALLOYS.
S. P. Lynch. Dec 72, 25p ARL/MET-NOTE-86

Descriptors: *Fracture strength, *High strength alloys, *Microstructure, *Tensile deformation, Aluminum alloys, Magnesium alloys, Tensile strength, Zinc alloys.

For abstract, see STAR 1118

N73-27448/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OXIDATION AT THROUGH-HOLE DEFECTS IN FUSED SLURRY SILICIDE COATED COLUMBIUM ALLOYS FS-85 AND CB-752.
S. R. Levine. Jul 73, 35p NASA-TN-D-7324, E-7330
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Cleveland.

Descriptors: *Contamination, *Crystal defects, *Niobium alloys, *Silicides, Oxidation, Protective coatings, Thermal protection.

For abstract, see STAR 1118

N73-27452/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A SIMPLIFIED DUCTILE-BRITTLE TRANSITION TEMPERATURE TESTER.
A. Arias. Aug 73, 12p NASA-TM-X-2853, E-7448

Descriptors: *Bending, *Test equipment, *Transition temperature, Alloys, Body centered cubic lattices, Brittleness, Ductility, Metal working.

For abstract, see STAR 1118

N73-27455/7GA PC$4.25/MF$1.45
Imperial Metal Industries, Ltd., Kidderminster (England). Witton Research Services Dept.
STRESS CORROSION OF TITANIUM ALLOYS BY VITON B.
I. R. Scholes, and R. L. Williams. Nov 72, 45p D-MAT-191, BR34640
Contract MIN-DEF/PE-KR/45/F

Descriptors: *Stress corrosion cracking, *Thermal degradation, *Titanium alloys, *Viton rubber (Trademark), Coatings, Hydrofluoric acid, Sealers, Service life, Temperature effects, Time dependence.

For abstract, see STAR 1118

N73-27457/3GA PC$6.50/MF$1.45
Rolls-Royce, Ltd., Leavesden (England). Small Engine Div.
AN EVALUATION OF THE PROPERTIES OF DOUBLE MELTED 18 PERCENT NI CO MO MARAGING STEEL.
A. E. Longley. 1972, 87p S/T-MEMO-3-72, BR28509
Contract KS/1/0338/C.B.43(A)2

Descriptors: *Fatigue tests, *Heat treatment, *Maraging steels, *Mechanical properties, Bars, Corrosion resistance, Forging, High strength steels, Materials science, Melting, Microstructure, Tensile strength.

For abstract, see STAR 1118

N73-27780/8GA PC$3.00/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
THE INFLUENCE OF REPEATED SOLUTION TREATMENT AND AGEING CYCLES ON THE FATIGUE STRENGTH OF L.65 ALUMINUM ALLOY.
J. Y. Mann. Dec 72, 19p ARL/SM-NOTE-386

Descriptors: *Aluminum alloys, *Axial loads, *Cyclic loads, *Fatigue (Materials), *Materials tests, Aging (Materials), Mechanical properties, Physical properties.

For abstract, see STAR 1118

N73-28531/4GA PC$3.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
EFFECT OF BOUNDARY SURFACE-ACTIVE VAPORS ON THE BEHAVIOR OF STEEL DURING SLIDING FRICTION.
H. Uetz, and J. Foehl. Jul 73, 16p NASA-TT-F-14993
Contract NASW-2482
Tran-Transl. Into English from the Publ. "Einfluss Grenzflaechenaktiver Daempfe Auf das Verhalten von Stahl bei Gleitreibung" May 1971 p 183-187.

Descriptors: *Sliding friction, *Steels, *Surface reactions, *Vapors, Acetone, Cyclohexane, Wear tests.

For abstract, see STAR 1119

N73-28576/9GA PC$3.00/MF$1.45
Rice Univ., Houston, Tex. Dept. of Chemistry.
THE EMISSIVITIES OF LIQUID METALS AT THEIR FUSION TEMPERATURES.
D. W. Bonnell, J. A. Treverton, A. J. Valerga, and J. L. Margrave. 1972, 10p NASA-CR-133521
Contract NGL-44-006-001

Descriptors: *Emissivity, *Fusion (Melting), *Liquid metals, *Melting points, Levitation, Liquid phases, Temperature.

For abstract, see STAR 1119

ORNL-TM-3734/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
EFFECT OF AGING TIME AND TEMPERATURE ON THE IMPACT AND TENSILE BEHAVIOR OF L-605: A COBALT BASE ALLOY.
D. T. Bourgette. Apr 73, 31p
Contract W-7405-eng-26

Descriptors: (*Haynes 25 alloy, *Mechanical properties), Aging, Embrittlement, High temperature, Impact strength, Temperature dependence, Tensile properties, Time dependence.

For abstract, see NSA 28 03, number 06278.

ORNL-TM-4145/GA PC$9.50/MF$1.45
Oak Ridge National Lab., Tenn.
REACTIONS AND TRANSPORT PHENOMENA AT SURFACES. WATER RESEARCH PROGRAM BIENNIAL PROGRESS REPORT, MARCH 15, 1968--NOVEMBER 1, 1970.
F. A. Posey, and G. E. Moore. May 73, 149p
Contract W-7405-eng-26

Descriptors: (*Water, *Chemical reactions), Corrosion, Desalination, Mass transfer, Metals, Research programs, Surfaces.

For abstract, see NSA 28 03, number 07757.

ORNL-TM-4175/GA PC$8.00/MF$1.45
Oak Ridge National Lab., Tenn.
DESIGN OF INDUCTION PROBES FOR MEASUREMENT OF LEVEL OF LIQUID METALS.
C. V. Dodd, C. C. Cheng, C. W. Jr. Nestor, and R. B. Hofstra. May 73, 118p
Contract W-7405-eng-26

Descriptors: (*Liquid metals, *Levels), (*Level indicators, *Design), Bismuth, Computer calculations, Eddy current testing, High temperature, Probes, Specifications.

For abstract, see NSA 28 02, number 03123.

ORO-3935-25/GA PC$7.60/MF$1.45
Maryland Univ., College Park. Dept. Of Mechanical Engineering.
STUDY OF ALLOY STRENGTHENING DUE TO ATOMIC ORDER. PROGRESS REPORT, MAY 1, 1972--APRIL 30, 1973.
M. J. Marcinkowski. 1973, 280p
Contract AT(40-1)-3935

Descriptors: (*Alloys, *Mechanical properties), Electronic structure, Strain hardening, Tensile properties.

For abstract, see NSA 28 02, number 05056.

ORO-3940-4/GA PC$3.00/MF$1.45
Oklahoma Univ., Norman.
THERMOELECTRIC SIZE EFFECT IN NOBLE METALS. PROGRESS REPORT, MAY 1, 1972--APRIL 30, 1973.
R. R. Bourassa. 1973, 11p
Contract AT(40-1)-3940

Descriptors: (*Gold, *Thermoelectric properties), (*Aluminium, Thermoelectric properties), (*Indium, Thermoelectric properties), Diffusion, Electric potential, Electrons, Foils, Low temperature, Temperature dependence, Thallium additions, Thermoelectricity, Thickness, Ultralow temperature, Vacancies, Very low temperature, Wires.

For abstract, see NSA 28 02, number 03194.

PAT-APPL-306 510/GA PC$3.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
DUCTILE SUPERCONDUCTING ALLOYS.
Patent Application,
Chang C. Tsuei. Filed 14 Nov 72, 16p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Superconductors, *Patent application), Wire, Particulate composites, Copper alloys, Niobium containing alloys, Ductility, Cryogenics.
Identifiers: PAT-CL-29-599.

The patent application provides an alloy for the commercial production of a ductile superconducting wire wherein superconductivity is produced by the proximity effect or by filament or both. In one embodiment a specific alloy of ductile non-superconductor and superconductor components is provided in a composite consisting of Cu and Nb having discrete randomly distributed Nb particles and/or filaments imbedded in and dispersed in close proximity throughout the composite. This forms an inhomogenous system of proximately spaced boundaries between the non-superconducting and the superconducting components for effecting the production of continuous superconducting paths throughout the composite at low temperatures in both the superconductor and non-superconductor components.

PATENT-3 734 690/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
CORROSION SURVEILLANCE SYSTEM.
Patent,
Morris Kolodney, and William Arbiter. Filed 28 Apr 70, patented 22 May 73, 5p PAT-APPL-32 542
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Corrosion, *Monitors), (*Patents, Monitors), Corrosive liquids, Structural members.
Identifiers: PAT-CL-23-230-C.

The patent describes an on-line corrosion surveillance system for monitoring corrosion damage to a structural component containing a corrosive liquid. A fine control element is, during operation, drawn longitudinally through the structural component and subsequently measured for corrosion damage due to its exposure to the corrosive liquid within the component. The control element is made of the same material as the structural component and specially constructed sealing means is provided for preventing escape of the corrosive liquid from the component as the control element is moved therethrough.

PATENT-3 744 972/GA Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
NONDESTRUCTIVE SPOT TEST METHOD FOR MAGNESIUM AND MAGNESIUM ALLOYS.
Patent.
M. L. Wilson. Patented 10 Jul 73, 4p NASA-CASE-LAR-10953-1,
Misc-Filed 16 Jul. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Chemical tests, *Color, *Magnesium, *Magnesium alloys, *Surface reactions, Aerospace engineering, Nondestructive tests, Patents.

A method for spot test identification of magnesium and various magnesium alloys commonly used in aerospace applications is described. The spot test identification involves color codes obtained when several drops of 3 M hydrochloric acid are placed on the surface to be tested. After approximately thirty seconds, two drops of this reacted acid is transferred to each of two depressions in a spot plate for additions of other chemicals with subsequent color changes indicating magnesium or its alloy.

PB-223 577/8GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
A COMPARISON OF LAPPING AND LINISHING AS SAMPLE PREPARATION TECHNIQUES FOR THE X-RAY FLUORESCENCE ANALYSIS OF LOW ALLOY STEELS,
A. A. Tunney. Aug 73, 6p BISRA-GS/EX/4/73/C

Descriptors: (*Low alloy steels, *X ray analysis), (*Polishing, Low alloy steels), Quality control, Silicon, Manganese, Phosphorus, Sulfur, Chromium, Molybdenum, Nickel, Niobium, Tin, Titanium, Vanadium, Zirconium, Chemical analysis, X ray fluorescence, Great Britain.

A selection of low alloy steel standards has been repetitively analysed for Si, Mn, P, S, Cr, Ni, Mo, Nb, Sn, Ti, V and Zr on an X-ray fluorescence spectrometer using both lapping and linishing as surface preparation techniques. Overall 95% confidence limits have been calculated for each surface treatment, and plots of coefficient of variation against concentration prepared for each element. The results indicate that the manual setting-up of the spectrometer is the dominant factor in determining the final precision achieved and that lapped samples give no improvement in precision compared with linished samples. The latter technique can therefore be used with confidence for the X-ray analysis of low alloy steel samples for production control where speed of analysis is critical.

PB-223 683/4GA PC$3.00/MF$1.45
BISRA-The Corporation Labs. of the British Steel Corp., London (England).
SELECTION AND MONITORING OF ATMOSPHERIC EXPOSURE SITES FOR CORROSION TESTS,
J. F. Stanners. Aug 73, 12p BISRA-CEL/CH/13/70

Descriptors: (*Field corrosion tests, Site surveys), Planning, Atmospheric corrosion tests, Evaluation, Economic analysis, Great Britain.

The choice of natural atmospheres for corrosion tests is influenced by practical factors, including accessibility, security of tenure, cost and freedom from vandalism. But these must not be allowed to outweigh the technological and scientific requirements, which are discussed in detail. The variables influencing corrosion or breakdown rates under service conditions must be recognized and the one that predominates in its influence identified. Sulphur pollution, chloride from the sea, pH of rain, metal temperature, time-of-wetness, and solar radiation are discussed. A system is proposed for keeping the number of sites to a minimum.

PB-223 684/2GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
DEVELOPMENT OF ARGON ARC MELTING TECHNIQUES FOR THE PREPARATION OF SOLID SPECIMENS FOR INSTRUMENTAL ANALYSIS FROM DRILLINGS,
H. Hughes. Aug 73, 13p BISRA-GS/TECH/251/1/73/C

Descriptors: (*Metallurgical analysis, Samples), Steels, Preparation, Arc melting, Chemical analysis, Argon, Great Britain.

A technique has been developed for the preparation of solid samples for instrumental analysis from drillings, millings or turnings, using an argon arc remelting furnace. Comparative analyses have been carried out on cast buttons prepared in the furnace and the parent solids from which the buttons originated. Both optical emission and X-ray fluorescence were used to determine Si, Mn, P, S, Cr, Mo, Ni, Cu, Nb, Sn, Ti, V and Zr in the samples. Comparative analyses were also made for C, Al and B using optical emission only. The results indicate that the remelting technique can be used with confidence for the determination of all these elements in steel with the exception of Zr, Losses (and apparent gains) do occur in certain cases but these are reproducible and can be corrected for in calibration.

PB-223 686/7GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
THE FORMABILITY OF PRECIPITATION HARDENED STEELS,
N. A. Cantalejos, and R. A. Maynard. Aug 73, 7p BISRA-MT/4/73

Descriptors: (*Formability, *Precipitation hardening steels), Great Britain, Metal sheets, Ductility, Tensile properties, High strength steels, Fracture strength.

The main concern of the research program is the study of the cold formability of high strength sheet steels having yield strengths of the order of 350 N/sq.mm. The interest in forming these steels originates with the increasing usage of strong steels in thin sections in a wide range of pressing applications where the formed component is required to withstand severe service conditions. Typically, strengths of up to 500 N/sq.mm are being demanded, in contrast to the 160-240 N/sq.mm found in the majority of steels currently sold for cold forming. The problem is that, generally, the higher the strength of the materials, the more difficult it is to form. (Author)

PB-223 687/5GA PC$4.25/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
A REVIEW OF RECENT OBSERVATIONS ON THE DEFORMED, RECOVERED AND RECRYSTALLISED STATES IN IRON AND LOW CARBON FERRITIC STEELS,
Cuppam Dasarathy. Aug 73, 41p BISRA-SM/668/A

Descriptors: (*Steels, Deformation), (*Iron, Deformation), (*Cold rolling, Steels), (*Crystallization, Steels), Crystal structure, Great Britain, Reviews.

The review is based on an invited lecture series delivered at certain metallurgical institutions in India during September, 1972. Over the past decade, major observations have been made on several important aspects of the deformed, recovered and recrystallized states in pure iron and low carbon steels. The salient features of these observations are reviewed in the present document under three main sections, the deformed state, the recovered state and the recrystallized state. Although the review deals essentially with low carbon ferritic steels, related observations on pure iron are also included wherever considered appropriate. The review is supported by eighty-four literature references.

PB-223 709/7GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
HIGH STRENGTH HEAVY GAUGE STRIP BY CONTROLLED COOLING,
P. Mella, and Jun 73, 16p BISRA-MT/7/73

Descriptors: (*Metal strip, *High strength steels), (*Cooling, Metal strip), Liquid cooling, Cooling rate, Mechanical properties, Great Britain.

It is shown that simple, inexpensive strip steels can be upgraded to higher strength levels by employing rapid cooling immediately after hot rolling. Two steels differing mainly in their manganese contents were studied to determine the influence of thickness and composition on the effectiveness of this treatment. It is confirmed that the property improvements achieved originate with the resulting microstructural refinement, strengths of up to 414 N/sq mm(26 tonf/sq in) together with excellent ductility and impact properties having been attained in 6.3 mm thick strip. It is likely that a controllable water cooling system could be used to counteract the effect of thickness on strength.

PB-223 715/4GA PC$2.70/MF$1.45
Bureau of Mines, Washington, D.C.
CORROSION RESISTANCE OF METALS IN HOT BRINES: A LITERATURE REVIEW.
Information circular, 1971-72,
Lloyd H. Banning, and Laurance L. Oden. Aug 73, 45p* BuMines-IC-8601
Prepared in cooperation with Albany Metallurgy Research Center, Oregon. Library of Congress Catalog Card No. 128.27:8601.
Paper copy also available from GPO as Stock No. 2404-01435 $0.70.

Descriptors: (*Corrosion, *Brines), (*Steam, Corrosion), (*Reviews, Corrosion), Metals, Alloys, Geothermy.

Electrical energy generated from dry geothermal steam and steam flashed from hot pressurized geothermal water will increase in importance in the next few decades. Geothermal fluids, which contain appreciable quantities of dissolved salts and gases, are generally corrosive to materials of construction. Since data on corrosion of materials in geothermal brines is limited, the literature was surveyed through February 1972 to obtain a compilation of information on corrosion resistance of aluminum and its alloys, copper and copper-base alloys, carbon steel and vast iron, stainless steels, chromium-iron alloys, nickel- and cobalt-base alloys, and titanium in heated sea water as well as in geothermal brines. The report has 47 references. (Modified author abstract)

PB-223 716/2GA PC$5.25/MF$1.45
National Materials Advisory Board (NAS-NAE), Washington, D.C.
TRENDS IN USAGE OF TUNGSTEN.
Final rept.
Jul 73, 106p* NMAB-309
Contract GS-00-DS-(P)-94008

Descriptors: (*Tungsten, Utilization), Trends, Supply(Economics), Demands(Economics), Consumption, Substitutes, Stockpiling.

The demand for tungsten in the U.S. economy is discussed in relation to domestic and world production. Present uses of tungsten are considered as well as possible new requirements in the future. The U.S. estimated for the next 15 years in 5-year intervals. Since tungsten is a strategic material and domestic production currently supplies between one half and two thirds of U.S. requirements, it is concluded that a government stockpile is needed today. By 1987, domestic reserves are expected to furnish only one quarter of the U.S. requirement. General recommendations are made concerning the future development of tungsten statistics necessary for estimating tungsten requirements more accurately. Government stockpile specifications are reviewed. (Author)

PB-223 730/3GA PC$2.75/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
A PROGRAM TO PROCESS STEEL ANALYSIS DATA FROM AN A. R. L. 72000 X-RAY FLUORESCENCE SPECTROMETER.
A. A. Tunney. Aug 73, 8p* BISRA-GS/EX/22/73/C

Descriptors: (*Steels, *X-ray analysis), (*Low alloy steels, X-ray analysis), (*Automation, X-ray fluorescence), Data processing, Silicon, Manganese, Phosphorus, Sulfur, Chromium, Molybdenum, Nickel, Titanium, Copper, Niobium, Tin, Vanadium, Zirconium, Chemical analysis, Great Britain.
Identifiers: Computer aided analysis.

A program to process the data obtained in the analysis of mild and low alloy steels by X-ray fluorescence is briefly described. The program corrects for changes in calibration curves which occur due to instrumental drift and also corrects for features such as line overlap prior to conversion of intensities into percentages. The performance of the program in correcting for drift is illustrated and the long term precision obtained over a period of seven months is given in detail. The results make a strong case for wide application to instruments at present without data processing facilities because of the better overall analytical performance and the more efficient use of expensive equipment which would result from full computer control of operation. The system described is easily adaptable to any direct reading instrument either for use with an off-line or small dedicated computer.

PB-223 740/2GA PC$4.25/MF$1.45
Ames Lab., Iowa.
THE METALLURGICAL UPGRADING OF AUTOMOTIVE SCRAP STEEL.
Final rept.,
O. N. Carlson, and F. A. Schmidt. Oct 73, 101p
EPA-670/2-73-091
Grant EPA-R-801303

Descriptors: (*Metal scrap, *Melting), (*Steels, Metal scrap), Waste disposal, Arc melting, Vacuum melting, Induction melting, Upgrading, Purification, Casting, Copper, Chromium, Tin, Carbon, Stainless steels, Aluminum, Nickel, Mechanical properties, Slags, Materials recovery.
Identifiers: Electroslag remelting, Solid waste disposal, Waste recycling.

Several melting and casting techniques that have been successfully used for purifying refractory metals were evaluated as methods of upgrading automotive scrap steel. These methods included (1) nonconsumable electrode arc melting, (2) electron beam melting, (3) vacuum arc melting, (4) vacuum induction melting, and (5) electroslag remelting. The removal of copper, chromium, and tin from the scrap was of primary interest because these impurity elements are not removed during the steelmaking process but are known to adversely affect the mechanical properties of steel. The optimum conditions for impurity removal by the melting techniques were determined using simulated auto scrap in small-scale melting experiments. Once these conditions were established, they were used to melt actual auto scrap obtained from a commercial source. Evaluation of the processed material was made by chemical analysis, metallographic examination, and mechanical property measurements. (Author)

PB-223 774/1GA PC$3.00/MF$1.45
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
CAVITATION DAMAGE SCALE EFFECTS-STATE OF THE ART SUMMARIZATION.
Technical rept.,
F. G. Hammitt. Aug 73, 17p UMICH-01357-31-T
Grant NSF-GK-1889

Descriptors: (*Cavitation corrosion, Reviews), Damage.

Working Group No. 1, 'Cavitation Scale Effects Between Model and Prototype' of the Section for Hydraulic Machinery, Equipment, and Cavitation of IAHR selected for its first task the investigation of the 'Effects of Gas Content upon Cavitation Inception, Performance, and Damage,' and published two summary reports upon the present state of the art in that field under the above title. As a second task, Working Group No. 1 has selected the area of Cavitation Damage Scale Effects. The present document is a first draft of a summation of the state of the art in that field.

PB-223 903/6GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
PREPARATION OF SAMARIUM-COBALT PERMANENT MAGNETS.
Rept. of investigations 1972-1973,
J. W. Walkiewics, J. S. Winston, and M. M. Wong. 1973, 23p BuMines-RI-7784
Prepared by Reno Metallurgy Research Center, Nev.

Descriptors: (*Cobalt intermetallics, *Permanent magnets), (*Samarium intermetallics, Permanent magnets), Preparation, Powder metallurgy.
Identifiers: Cobalt samarium.

Studies were conducted to develop a method for fabricating Sm-Co permanent magnets. This method consisted of arc-melting, crushing, and grinding the alloy; aligning and pressing the powder; and sintering the green compacts. Results indicate that the optimum composition was 36.7 wt pct Sm, 63.3 wt pct Co. This composition was obtained by blending together Sm_2Co_7 and $SmCo_5$. The maximum values experimentally obtained were sub M (H) SUB C = 27.4 kOe, sub B (H) sub C = 7,510 Oe, B sub r = 7,810 G, and (BH) sub Max = 15.1 MGOe. The optimum sintering temperatures and grinding times for maximum sub M (H) sub C and (BH) sub Max were determined. (Author)

RD/B/N-2202/GA PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
LATTICE AND GRAIN BOUNDARY DIFFUSION OF MANGANESE IN 20/25/NB STAINLESS STEEL.
A. F. Smith. Jan 73, 17p
U.S. Sales Only.

Descriptors: (*Stainless steel-20-25, *Diffusion), (*Manganese, Diffusion), Agr type reactors, Crystal lattices, Density, Dislocations, Fuel cans, Grain boundaries, Impurities, Niobium additions, Oxidation.

For abstract, see NSA 28 02, number 03195.

RD/B/N-2521/GA PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
STUDY OF CORROSION AND DEPOSITION IN LIQUID METALS. PART I. OBSERVATIONS ON WEDGING CORROSION AND MASS TRANSPORT IN THE SYSTEM ZIRCONIUM/SODIUM/STAINLESS STEEL AT 650 EXP 0 C.
S. B. Fisher, and A. J. Hooper. Dec 72, 17p
U.S. Sales Only.

Descriptors: (*Zirconium, *Corrosion), (*Stainless steels, Corrosion), (*Sodium, *Corrosive effects), Electron microscopy, High temperature, Mass transfer, Oxidation, Oxygen, Particle size, X-ray diffraction.

For abstract, see NSA 28 02, number 03133.

RD/B/N-2544/GA PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.

STUDIES ON WASTAGE OF MATERIALS IN THE VICINITY OF SODIUM--WATER REACTIONS. PART I. PRELIMINARY RESULTS OF THE WASTAGE OF CANDIDATE BOILER TUBE MATERIAL IN A SODIUM--WATER VAPOUR FLAME.
R. N. Newman, and C. A. Smith. Jan 73, 12p CFR-BMWP-P-(73)136
U.S. Sales Only.

Descriptors: (*Chromium-molybdenum steels, *Corrosion), (*Stainless steel-316, Corrosion), (*Incoloy 800, Corrosion), (*Nickel, Corrosion), Combustion, Corrosive effects, Flames, Primary coolant circuits, Sodium, Steam generators, Tubes, Vapors, Water.

For abstract, see NSA 28 02, number 03134.

RFP-2005/GA PC$3.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
URANIUM--TITANIUM ALLOYS: ANNOTATED BIBLIOGRAPHY.
R. J. Jackson. 6 Apr 73, 22p
Contract AT(29-1)-1106

Descriptors: (*Uranium alloys, *Bibliographies), (*Titanium alloys, Bibliographies), Binary alloy systems.

For abstract, see NSA 28 02, number 03124.

SCL-DR-720035/GA PC$3.25/MF$1.45
Sandia Labs., Livermore, Calif.
INFLUENCE OF SULFUR CONTENT ON THE IMPACT STRENGTH OF ELECTROFORMED NICKEL.
J. W. Dini, H. R. Johnson, and H. J. Saxton. Mar 73, 25p
Contract AT(29-1)-789

Descriptors: (*Nickel, *Impact strength), Charpy test, Electroplating, Impact tests, Knoop hardness, Mechanical properties, Notches, Stresses, Sulfur.

For abstract, see NSA 28 02, number 05065.

SGAE-2074/GA PC$4.25/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Institut fuer Reaktortechnik.
CORROSION EXPERIMENT 1.6. FINAL REPORT.
N. Schwarz, G. Kohl, and O. Weiser. Dec 72, 43p SGAE-RT-49/72
In German. U.S. Sales Only.

Descriptors: (*Manganese alloys, *Corrosion), (*Chromium alloys, Corrosion), (*Molybdenum alloys, Corrosion), (*Nickel alloys, Corrosion), Corrosive effects, Liquid flow, Liquid metals, Sodium, Steels, Very high temperature.

For abstract, see NSA 28 02, number 03135.

SLA-73-5375/GA PC$3.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
DYNAMIC YIELD STRENGTH DETERMINATION AT ELEVATED TEMPERATURES AFTER NANOSECOND PULSE HEATING.
J. Lipkin. 1972, 31p CONF-730511-3

Descriptors: (*Aluminium alloys, *Yield strength), (*Magnesium alloys, Yield strength), Electron beams, Heating, Pulse techniques.

For abstract, see NSA 28 03, number 07793.

TIM-663/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
NIOBIUM-1 ZIRCONIUM ALLOY FORCED CONVECTION LITHIUM CORROSION LOOP TESTS LCCBK-2A2, -3A3, AND -4A4.
G. W. Bersin. 25 Jul 61, 16p
Contract AT(30-1)-2789

Descriptors: (*Niobium base alloys, *Corrosion), (*Zirconium alloys, Corrosion), (*Lithium, *Corrosive effects), Forced convection, Liquid metals, Medium temperature, Pumps, Testing.

For abstract, see NSA 28 02, number 03136.

TIM-813/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
PROGRAM TO STUDY THE EFFECTS OF NEUTRON IRRADIATION UPON NIOBIUM BASE ALLOYS.
C. E. Carlson. 12 Mar 64, 14p

Descriptors: (*Niobium base alloys, *Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Carbon additions, Physical radiation effects), Neutron beams, Planning.

For abstract, see NSA 28 02, number 03292.

TIM-813(Suppl.1)(Rev.1)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
PROGRAM TO STUDY THE EFFECTS OF NEUTRON IRRADIATION UPON NIOBIUM BASE ALLOYS.
C. E. Carlson. 17 Jun 64, 4p

Descriptors: (*Niobium base alloys, *Physical radiation effects), (*Zirconium, Physical radiation effects), (*Carbon additions, Physical radiation effects), Neutron beams, Planning.

For abstract, see NSA 28 02, number 03293.

UCLA-34-P-172-7/GA PC$4.00/MF$1.45
California Univ., Los Angeles. Dept. Of Materials.
PARTICLE SIZE DISTRIBUTION EFFECTS IN PRECIPITATION HARDENING. THIRD ANNUAL PROGRESS REPORT FOR THE CONTRACT PERIOD FEBRUARY 1, 1971--DECEMBER 31, 1971.
A. J. Ardell. Jan 72, 37p UCLA-ENG-7214
Contract AT(04-3)-34

Descriptors: (*Nickel alloys, Precipitation hardening), (*Chromium alloys, Precipitation hardening), (*Aluminium alloys, Precipitation hardening), (*Precipitation hardening, *Particle size), Distribution.

For abstract, see NSA 28 03, number 07806.

UCRL-74078/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
APPLICATION OF STRIP STRAIN GAGES FOR MEASURING RESIDUAL STRESSES IN BERYLLIUM.
G. R. Dittbenner. 14 Sep 72, 12p CONF-730511-1

Descriptors: (*Beryllium, *Residual stresses), (*Strain gages, *Performance testing), Surfaces, Uses.

For abstract, see NSA 28 03, number 06285.

Y-1871/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
MAGNETIC PERMEABILITY AND MECHANICAL PROPERTY MEASUREMENTS ON VARIOUS COLD WORKED STATES OF 316 STAINLESS STEEL.
M. W. Poore. 27 Mar 73, 101p
Contract W-7405-eng-26

Descriptors: (*Stainless steel-316, *Magnetic susceptibility), Cold working, Mechanical properties, Rolling, Surfaces.

For abstract, see NSA 28 02, number 03196.

11G. Miscellaneous Materials

N73-28594/2GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DIELECTRIC CONSTANT AND LOSS TANGENT OF ECCOFOAM PT, AT 2.3 GHZ, FOR VARIOUS PACKING DENSITIES.
F. L. Lane. 15 Jul 73, 10p NASA-CR-133550, JPL-TR-32-1433-REV-1
Contract NAS7-100
Misc-Revised.

Descriptors: *Density (Mass/volume), *Foams, *Permittivity, Antennas, Electrical properties, Laminates.

For abstract, see STAR 1119

PATENT-3 736 126/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
GOLD RECOVERY FROM AQUEOUS SOLUTIONS.
Patent,
James S. Fritz, and William G. Millen. Filed 24 Sep 71, patented 29 May 73, 3p PAT-APPL-183 659
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, *Gold), (*Materials recovery, Gold), Chlorides, Adsorbents, Complex compounds, Acrylic resins, Hydrochloric acid, Acetone.
Identifiers: PAT-CL-75-118.

The patent describes a method for recovering gold from aqueous solutions such as aqueous industrial process solutions by acidifying the solution and adding chloride ion to the solution to complex the gold, thus forming a feed solution and passing the feed solution through an adsorption bed, said adsorption bed selected from the group consisting of polymers of lower aliphatic esters of acrylic acid and lower aliphatic esters of methacrylic acid whereby the gold is adsorbed on the bed. (Author)

PB-223 935/8GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
LARGE-SCALE CONTINUOUS ATTRITION GRINDING OF COARSE KAOLIN.
Research rept. 1967-1969,
E. G. Davis, E. W. Collins, and I. L. Feld. Aug 73, 28p BuMines-RI-7771
Prepared in cooperation with the Bureau of Mines, Tuscaloosa, Ala. Metallurgy Research Lab.

Descriptors: (*Kaoline, *Grinding(Comminution)), Ultrafines, Attrition mills, Silicate minerals.
Identifiers: Paper coating clays.

Large-scale ultrafine grinding tests were made of coarse kaolin using the Bureau of Mines developed grinding process. A 20-inch diameter attrition grinder was used in continuous open- and closed-circuit systems. The studies included single- and multiple-stage open circuit grinding, and also continuous grinding in closed circuit with a 6-inch diameter centrifuge. Using a modified two-stage closed-circuit system, a ground product containing 88.5 percent minus 2-micron-esd material was produced from coarse clay that contained only 9.0 percent minus 2-micron-esd material. The electrical energy consumed during grinding was 327 kilowatt hours per ton of minus 2-micron-esd material produced.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-767 537/4GA PC$3.00/MF$1.45
Coating and Chemical Lab Aberdeen Proving Ground Md
AUTOMOTIVE ENGINE OIL SUPPLEMENTS: THEIR CHARACTERISTICS AND EFFECTIVENESS.
Final rept.,
Maurice E. Lepera, and John G. Sonnenburg. Aug 73, 32p* Rept no. CCL-3003

Descriptors: (*Lubricant additives, Effectiveness), Passenger vehicles, Viscosity, Density, Cleaning compounds.
Identifiers: Performance evaluation, Automobile engines, Foaming.

Crankcase oil additive concentrates, designed for use as an oil supplement oriented towards consumer or after market applications, were investigated in an attempt to define their overall performance effectiveness. Physiochemical data was generated on the eighteen oil concentrates to assist in understanding the mechanism of their reported activity. Their effectiveness, relative to dispersancy and detergency, was defined by developed laboratory techniques. The data subsequently generated revealed that many of the oil concentrates offered very marginal improvement in dispersancy and detergency whereas many created potential performance problems as a result of high foaming tendencies and increases in low temperature fluidity properties. (Author)

N73-27411/0GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ELASTOHYDRODYNAMIC FILM THICKNESS MODEL FOR HEAVILY LOADED CONTACTS.
S. H. Loewenthal, R. J. Parker, and E. V. Zaretsky. 1973, 31p NASA-TM-X-68267, E-7569
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab. Conf-Proposed for Presentation at Joint Lubrication Conf., Atlanta, 16-18 Oct. 1973; Cosponsored by AM. Soc. Of Lubrication Engr. And Asme.

Descriptors: *Elastohydrodynamics, *Film thickness, *Lubrication, *Prediction analysis techniques, Friction reduction, Mathematical models, Numerical analysis.

For abstract, see STAR 1118

N73-27414/4GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STUDY OF BALL BEARING TORQUE UNDER ELASTOHYDRODYNAMIC LUBRICATION.
D. P. Townsend, C. W. Allen, and E. V. Zaretsky. 1973, 38p NASA-TM-X-68271, E-7284
Conf-Proposed for Presentation at Joint Lubrication Conf., Atlanta, Ga., 16-18 Oct. 1973; Sponsored by AM. Soc. Of Lubrication Engr. And the Asme.

Descriptors: *Ball bearings, *Elastohydrodynamics, *Friction measurement, *Lubrication, Friction reduction, Performance tests, Thin films.

For abstract, see STAR 1118

N73-27417/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF LUBRICANT EXTREME PRESSURE ADDITIVES ON ROLLING ELEMENT FATIGUE LIFE.
R. J. Parker, and E. V. Zaretsky. Jul 73, 23p
NASA-TN-D-7383, E-7337

Descriptors: *Antifriction bearings, *Fatigue (Materials), *Lubrication, *Service life, Friction reduction, Materials tests, Rolling contact loads, Stress analysis.

For abstract, see STAR 1118

PAT-APPL-382262/GA PC$3.00/MF$1.45
Hughes Aircraft Co., Los Angeles, Calif.
THIOPHENYL ETHER DISILOXANES AND TRISILOXANES USEFUL AS LUBRICANT FLUIDS.
Patent Application.
N. Bilow, and R. I. Akawie. Filed 24 Jul 73, 12p
NASA-CASE-MFS-22411-1,
Contract NAS8-25138
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aerospace environments, *Lubricants, *Siloxanes, *Thermodynamic properties, Ethers, Patent applications, Triphenyls, Working fluids.

The utilization of thiophenyl ether disiloxane and trisiloxanes as lubricants and functional fluids over a wide range of temperatures and environments is examined. Properties of siloxanes include resistance to nuclear and solar radiation, low vapor pressure, low pour points, and good lubricity.

PATENT-3 674 690/GA Not available NTIS
Department of the Air Force Washington D C
AIR DRYING SILICONE RESIN BONDED DRY FILM LUBRICANT.
Patent,
William L. Clow, Robert J. Benzing, and Bobby D. McConnell. Filed 8 Jul 69, patented 4 Jul 72, 6p
Rept nos. PAT-APPL-840 022,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Lubricants, *Patents), (*Silicone plastics, Lubricants), Silanes, Molybdenum compounds, Antimony compounds, Siloxanes, Coatings.
Identifiers: PAT-CL-252-25, Antimony oxides, Molybdenum disulfide, Propylamine/triethoxysilyl, Silicone based lubricants.

The invention comprises a polysiloxane solid film lubricant coating cured by air drying to a film having lubricating and heat resistant properties. It is prepared by the process of admixing 0.4-6 volumes of a lubricating mixture per volume of binder, wherein the lubricant mixture consists essentially of 0.33-2 parts by weight of antimony oxide (Sb_2O_3) per part by weight of molybdenum sulfide (MoS_2) and said binder consists essentially of 3-25 parts by weight of an amino-silane compound with 100 parts of a polysiloxane prepolymer.

PATENT-3 678 145/GA Not available NTIS
Department of the Air Force Washington D C
METHOD FOR PREPARING METAL MATRIX COMPOSITES CONTAINING MODIFIED POLYTETRAFLUOROETHYLENE.
Patent,
David J. Boes. Filed 23 Dec 69, patented 18 Jul 72, 3p Rept nos. PAT-APPL-887 730,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Lubricants, *Composite materials), (*Patents, Lubricants), Halocarbon plastics, Heat treatment, Silver, Molybdenum compounds, Sulfides, Ball bearings, Wear resistance, Silver alloys, Mercury alloys.
Identifiers: Tetrafluoroethylene resins, Metal matrix composites, Self lubrication, Filled composites, PAT-CL-264-115.

The patent describes a self-lubricating composite. Polytetrafluoroethylene, sold under the trademark Teflon, is modified before being blended with metal powder and formed into a composite. Modification is accomplished by heating the Teflon for 1 to 2 hours at 1,000-1,100F and then for 3 to 3.5 hours at 650 to 750F. Metal matrix composites containing modified Teflon as a filler are useful as retainer materials for bearings which are subjected to high temperature operating conditions.

11I. Plastics

AD-767 256/1GA PC$2.75/MF$1.45
Frankford Arsenal Philadelphia Pa
FUNGUS RESISTANCE OF POLYVINYL ACETATE LATEX DUST CONTROL MATERIAL.
Memorandum rept.,
Leonard Teitell, and Sidney H. Ross. Jun 73, 19p
Rept no. FA-M73-19-1

Descriptors: (*Vinyl plastics, *Fungusproofing), (*Landing fields, Dust), Fungus deterioration, Microorganisms, Plasticity, Panama, Pyridines, Tropical regions, Helicopters.
Identifiers: *Polyvinyl acetate, Dust control, Pyridine/methylsulfonyl-tetrachloro, Latex.

A polyvinyl acetate latex material, intended for use as a dust control material for helicopter landing pads, was evaluated for fungus susceptibility. Laboratory tests included incubation of dried films on inorganic salts-agar and burial of specimens in biologically active soil. The dried films show a marked loss in flexibility, probably due to use of plasticizer by soil microorganisms. The dried films can be protected against fungus attack by the addition of a biocide (such as 2, 3, 5, 6-tetrachloro-4(methylsulfonyl) pyridine) to the latex material prior to casting the films. Examination of drums of liquid dust control material stored in the tropical climate of the Canal Zone showed evidence of microbiological contamination of the liquid latex. (Author)

BDX-613-869/GA PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo.
FABRICATION OF OPEN CELL POLYETHYLENE FOAM. TECHNOLOGICAL SPINOFF REPORT.
D. J. Fossey. Mar 73, 24p

Descriptors: (*Polyethylenes, *Fabrication), Configuration, Control, Foams, Sodium chlorides.

For abstract, see NSA 28 03, number 07658.

BDX-613-870/GA PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo.
EFFECT OF AMINE CATALYST ON COMPRESSIVE PROPERTIES OF URETHANE FOAM.
S. L. DeGisi, and T. E. Neet. Mar 73, 23p
Contract AT(29-1)-613

Descriptors: (*Urethane, *Compressibility), Aging, Amines, Catalysts, Foams, Physical properties.

For abstract, see NSA 28 02, number 04999.

CONF-730416-1/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
EFFECT OF POLAR GROUPS ON THE POST-IRRADIATION CONDUCTIVITY OF POLYSTYRENE.
W. W. Parkinson, M. J. Kelly, and I. O. Salyer. 1973, 31p

Descriptors: (*Condenser ionization chambers, *Radiation hardening), (*Dielectric materials, *Physical radiation effects), (*Polystyrene, Physical radiation effects), Capacitors, Electric conductivity, Errors.

For abstract, see NSA 28 03, number 05816.

11J. Rubbers

PAT-APPL-374421/GA PC$4.50/MF$1.45
Little (Arthur D.), Inc., Cambridge, Mass.
FLAME RETARDANT ELASTOMERIC COMPOSITIONS.
Patent Application.
J. T. Howarth, A. A. Massucco, K. R. Sidman, and S. G. Sheth. Filed 28 Jun 73, 46p NASA-CASE-MSC-14331-1,
Contract NAS9-10424
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Composite materials, *Fireproofing, *Nonflammable materials, *Space suits, *Textiles, Equipment specifications, Patent applications, Product development.

The development of flame retardant elastomeric compositions is discussed. The materials are used in fabricating flight clothing used during extravehicular activities. The process for producing the material is described. The novelty of the development is the use of urethane with retardant reacted directly into the polymer chain.

11L. Wood and Paper Products

AD-767 250/4GA PC$3.00/MF$1.45
Army Natick Labs Mass
EFFECT OF IONIZING RADIATION ON PHYSICAL AND CHEMICAL PROPERTIES OF FIBERBOARD AND PAPERBOARD.
Technical rept.,
John J. Killoran, Sheo Ram Agarwal, and Peter T. Burke. Oct 72, 26p* Rept no. USA-NLABS-TR-74-6-GP

Descriptors: (*Fiberboard, *Radiation damage), (*Composition board, Radiation damage), Irradiated foods, Electron bombardment, Gamma rays, Packing materials, Cellulose, Physical properties, Chemical properties, Tensile properties, Mechanical properties.

In a large-scale production of prepackaged radappertized (irradiation sterilized) foods there are advantages in performing the irradiation of filled metal cans or flexible packages while stacked in fiberboard or paperboard shipping containers. This study was performed to determine the effect of electron and gamma radiation on the physical and chemical properties and functional performance of the fiberboard and paperboard materials that are used in the packing of cans and flexible packages of radappertized foods. Electron and gamma radiation caused significant physical and chemical changes in the fiberboard and paperboard materials. Physical property values (puncture, burst, tear, tensile) decreased with increasing radiation dose (1, 3, and 6 megarads) and increasing irradiation temperature-(80C,-30C, and 21C). Whereas the component testing of fiberboard and paperboard and laboratory drop tests of fiberboard containers indicated that irradiation at a food-sterilization dosage level caused marked reductions in performance of the materials and containers made therefrom, these changes were not great enough to seriously impair the functional performance of the fiberboard and paperboard containers for packing of cans or packages of food during irradiation processing and subsequent shipment and storage. (Author)

AD-767 573/9GA PC$2.75/MF$1.45
Forest Products Lab Madison Wis
RESIN EFFICIENCY AND DIMENSIONAL STABILITY OF FLAKEBOARDS.
Forest Service research paper,
W. F. Lehmann, and F. V. Hefty. 1973, 10p Rept no. FSRP-FPL-207

Descriptors: (*Composition board, Wood), Particles, Amino plastics, Stability, Moisture.
Identifiers: *Particle boards, Dimensional stability.

Dimensional stability was studied in Douglas-fir particleboards prepared from a flake-particle mixture. Three levels of resin content and two levels of resin atomization and board density were used, with dimensional stability measured in both relative humidity and water-soak exposures. Below 80 percent relative humidity, study variables had virtually no effect on amount of movement in either thickness or length. More change occurred between 80 and 90 percent relative humidity but only resin content affected the amount of movement. In contrast, all variables affected degree of stability in ovendry-vacuum-pressure-soak conditions. Thus, while the soak test is fast and may be related to the relative humidity test, caution should be exercised in interpreting soak test data, especially where interior end uses are concerned. (Author)

AD-767 574/7GA PC$2.75/MF$1.45
Forest Products Lab Madison Wis
FACTORS AFFECTING PARTICLEBOARD PRESSING TIME: INTERACTION WITH CATALYST SYSTEMS.
Forest Service research paper,
W. F. Lehmann, R. L. Geimer, and F. V. Hefty. 1973, 22p Rept no. FSRP-FPL-208

Descriptors: (*Composition board, Wood), Compacting, Amino plastics, Phenolic plastics, Catalysts.
Identifiers: *Particle boards, *Pressboards.

In laboratory manufacture of particleboards, use of catalyst, high press temperature, fast closing, and nonuniform mat moisture content produced adequate 1/2-inch-thick, urea-bonded panels in 1 minute and phenolic-bonded panels in 2 minutes presstime. The use of a catalyst allows the reduction of presstime by approximately 1 minute for urea-formaldehyde resin systems, but no reduction was obtained with catalyzed phenol-formaldehyde systems. (Author)

AD-767 575/4GA PC$2.75/MF$1.45
Forest Products Lab Madison Wis
VIBRATION TRANSMISSIBILITY CHARACTERISTICS OF CORRUGATED FIBERBOARD.
Forest Service research paper,
W. D. Godshall. 1973, 20p Rept no. FSRP-FPL-211

Descriptors: (*Fiberboard, Vibration), (*Packing materials, Fiberboard), Damping, Resonant frequency, Containers.
Identifiers: Corrugating.

The report gives vibration transmissibility data for corrugated fiberboard under a wide variety of usage conditions. Resonant frequencies of loaded corrugated pads vary widely (35 to 140 Hz.), but generally are considerably above the fundamental forcing frequencies encountered in rail and truck shipment. Therefore, for these modes of transportation, corrugated fiberboard containers and pads are likely to neither amplify nor attenuate transportation vibrations. (Author)

PB-223 090/2GA PC$3.00/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Wood Research and Wood Construction Lab.
PALLET ASSEMBLED WITH HELICALLY THREADED AND HELICALLY FLUTED NAILS,
E. George Stern, and Earle B. Norris. Mar 73, 20p Bull-118

Descriptors: (*Pallets, *Nails(Fasteners)), Strength, Rigidity, Hardwoods, Impact tests, Assembling.

The quality of wooden pallets depends to a considerable extent on the effectiveness of the fasteners used for pallet assembly. The pallet life is greatly influenced by the effectiveness of the nails especially under adverse pallet use conditions. In order to provide information on the effectiveness of helically fluted versus helically threaded nails as are commercially available, fully comparative tests were performed on the effectiveness of those helically deformed and formed hardened-steel nails. Results are discussed.

PB-223 091/0GA PC$3.00/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Wood Research and Wood Construction Lab.
STRINGER VERSUS BLOCK WAREHOUSE PALLETS,
E. George Stern, and Earle B. Norris. Jun 73, 20p Bull-119

Descriptors: (*Pallets, Performance evaluation), Deformation, Gailure, Impact tests, Moisture content, Hardwoods.

The carefully assembled, sextuplicate, non-reversible, double-face, flush, four-way, dense-hardwood, nailed, 48 inches by 40 inches or 40 inches by 48 inches pallets with (a) three notched stringers, (b) nine blocks and three stringerboards, and (c) nine blocks, three stringerboards, and a bottom picture frame performed uniformly and deformed progressively without failing during the three-week delayed, twelve repetitive cornerwise free-fall drops. The lumber, mainly oak, which was assembled when green, had a relatively high moisture content during testing.

PB-223 092/8GA PC$3.00/MF$1.45
Virginia Polytechnic Inst., and State Univ., Blacksburg. Wood Research and Wood Construction Lab.
DOUGLAS FIR LUMBER PALLETS ASSEMBLED WITH STIFF-STOCK AND HARDENED-STEEL PALLET NAILS,
E. George Stern, and Earle B. Norris. Jul 73, 12p Bull-120

Descriptors: (*Pallets, *Nails(Fasteners)), Fir trees, Rigidity, Lumber, Assembling.

The use of hardened-steel, instead of stiff-stock, pallet nails up-graded the Douglas fir pallets significantly, whereas the use of peeler-core, instead of utility-grade, Douglas fir lumber had little, if any, influence on pallet rigidity.

PB-223 526/5GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
THE MOISTURE CONTENT AND SPECIFIC GRAVITY OF THE BARK AND WOOD OF NORTHERN PULPWOOD SPECIES.
Forest Service research note (Final),
John R. Erickson. Sep 72, 5p FSRN-NC-141

Descriptors: (*Wood wastes, Separation), (*Pulpwood, Wood wastes), Moisture content, Density(Mass/volume), Bark, Chips, Compressing, Removal.
Identifiers: Debarking.

The specific gravity of wood and bark based on a dry weight over green volume and dry weight over dry volume basis is not meaningful for purposes of segregating bark from wood chips. Knowledge of the 'as is' specific gravity is required because the physical systems performing the segregating must deal with the existing conditions of the chips. Therefore we determined the specific gravity of bark and wood chips of aspen, jack pine, red pine, sugar maple, white spruce, and balsam fir based on green weight over green volume, as well as in the conventional way. The means, ranges, and standard deviations of moisture content and specific gravities are given. (Author)

PB-223 554/7GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
SEGREGATION OF FOLIAGE FROM CHIPPED TREE TOPS AND LIMBS.
Forest Service research note (Final),
John A. Sturos. Jan 73, 5p FSRN-NC-146

Descriptors: (*Wood wastes, Separation), (*Pulpwood, Wood wastes), Separators, Test methods, Utilization, Harvesting, Forest trees, Recovery, Chips, Bark, Leaves.

An increase in forest utilization can be brought about by chipping logging residues or whole trees in the woods and removing the bark and foliage later. Because portable whole-tree chippers are now commercially available, methods must be developed for segregating bark and foliage from the chips. This paper discusses foliage removal results obtained from testing two methods of directing an airflow transverse to chips, bark, and foliage. The species tested were aspen, sugar maple, jack pine, red pine, balsam fir, and loblolly pine. Removing leaves was more successful than removing needles. Best results were obtained with sugar maple (88% foliage removal and 87% wood fiber recovery). More research is necessary to develop methods that will give a higher wood recovery. (Author)

PB-223 592/7GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
COMPRESSION DEBARKING OF WOOD CHIPS.
Forest Service research paper (Final),
Rodger A. Arola, and John R. Erickson. Jan 73, 15p* FSRP-NC-85

Descriptors: (*Wood wastes, *Separators), (*Pulpwood, Wood wastes), Compressing, Chips, Bark, Beneficiation, Test methods, Correlation techniques, Softwoods, Hardwoods.
Identifiers: Debarking.

The report presents results from two years testing of a single-pass compression process for debarking wood chips of several species. The most significant variable was season of cut. Depending on species, approximately 70% of the bark was removed from wood cut in the growing season while approximately 45% was removed from wood cut in the dormant season.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-767 085/4GA Reprint
Hawaii Univ Honolulu Dept of Physics and Astronomy
PATTERN RECOGNITION AS AN INDUCTIVE PROGRESS,
Satosi Watanabe. 1969, 15p AFOSR-TR-73-1616
Grant AF-AFOSR-1466-68
Availability: Pub. in Methodologies of Pattern Recognition, Academic Press Inc., 111 Fifth Avenue, New York, p521-534 1969.

Descriptors: (*Pattern recognition, Decision making), Mathematical logic, Mathematical models, Probability, Measure theory, Man-machine systems.
Identifiers: Bayesian analysis, Statistical inference.

It is well-known since the time of David Hume that inductive inference is not a purely logical process, hence pattern recognition cannot be free from logically arbitrary elements inherent in any inductive inference. It is then very important in the methodological study of pattern recognition to clarify how the inductive arbitrariness creeps into the method, and what kind of guiding principle of nonlogical nature is actually practiced to make the method work as a technique. The purpose of the paper is to try to do just that, using a mathematical model of induction proposed previously by the author. (Modified author abstract)

AD-767 096/1GA Reprint
Minnesota Univ Minneapolis Dept of Aerospace Engineering and Mechanics
PERIODIC SOLUTIONS OF SINGULARLY PERTURBED EQUATIONS ARISING FROM GYROSCOPIC SYSTEMS,
M. Balachandra. 15 Mar 72, 14p AFOSR-TR-73-1638
Grant AF-AFOSR-2284-72
Revision of report dated 2 Nov 71.
Availability: Pub. in Society for Industrial and Applied Mathematics, Jnl. on Applied Mathematics, v24 n4 p562-573 Jun 73.

Descriptors: (*Differential equations, Numerical analysis), Equations of motion, Matrix algebra, Gyroscopes, Perturbation theory, Integration, Theorems.
Identifiers: Periodic functions, Periodic solutions.

Differential equations for mechanical systems containing gyroscopic rotors spinning at high angular velocity are converted to a set of singularly perturbed equations. The problem of the existence of T-periodic solutions to these equations is considered. Sufficient conditions are obtained under which the existence of a T-periodic solution to the lower order reduced equations implies the existence of a T-periodic solution to the original system. (Author)

AD-767 105/0GA PC$3.00/MF$1.45
Wisconsin Univ Madison Dept of Statistics
STATISTICAL MODELS FOR CONTROL, OPTIMIZATION, RELIABILITY, AND LIFE TESTING.
Annual rept. 1 Jun 72-31 May 73,
George E. P. Box, and Grace Wahba. 31 May 73, 7p AFOSR-TR-73-1641
Grant AF-AFOSR-2363-72

Descriptors: (*Statistical analysis, Mathematical models), Control systems, Reliability, Stochastic processes, Scientific research.
Identifiers: Control theory, Maximum likelihood estimation, Life tests.

The areas of research include topics of stochastic systems (especially with discrete control), statistical model building, the state variable approach, the effects of constraints on the degree of possible manipulation of a system, appropriate algorithms for optimal feed forward control, closed loop operations, discrete control and estimation, maximum likelihood estimation for the parameters of a dynamic model, estimation of the parameters in a stationary linear dynamic model, statistical analysis of the polynomial algorithm for probability density function estimation, estimation in nonlinear systems, bounds for optimal mean square-error for probability density function estimation, density function estimation using interpolating spline functions, and the use of reproducing kernel Hilbert space techniques for the continuous time constrained control problems. (Author)

AD-767 111/8GA Reprint
Utah Univ Salt Lake City
OSCILLATION CRITERIA FOR Y DOUBLE PRIME + P(T)F(Y,Y') - 0 WITH F HOMOGENEOUS OF DEGREE ONE,
G. B. Gustafson. 23 Nov 72, 18p AROD-9157:13-M
Grant DA-ARO-D-31-124-72-G56
Availability: Pub. in Canadian Jnl. of Mathematics, v25 n2 p323-337 1973.

Descriptors: (*Nonlinear differential equations, Theorems), Oscillation, Inequalities.
Identifiers: Riccati equation.

AD-767 122/5GA PC$3.75/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ADJOINT DOMAINS AND LG-SPLINES.
Technical summary rept.,
R. C. Brown. Aug 73, 31p Rept no. MRC-TSR-1341
Contract DA-31-124-ARO(D)-462

Descriptors: (*Differential equations, Functional analysis), Hilbert space, Matrix algebra, Measure theory, Theorems, Approximation(Mathematics).
Identifiers: Spline functions.

The paper develops a general theory characterizing the Lg-spline (in a Hilbert space norm) for a regular nth order vector differential operator interpolating a general set of functionals represented by measures of bounded variation. The theory is applied to several special cases considered by other authors. (Author)

AD-767 123/3GA PC$3.75/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
CONDITIONS FOR THE EXISTENCE OF N PERIODIC SOLUTIONS OF LIENARD'S EQUATION.
Technical summary rept.,
Rui J. P. de Figueriredo. Jul 73, 34p Rept no. MRC-TSR-1332
Contract DA-31-124-ARO(D)-462, Grant NSF-GU-1153

Descriptors: (*Nonlinear differential equations, Integration), Oscillation, Numerical analysis, Theorems.
Identifiers: *Lienard equation, Existence theorems, Periodic solutions.

Conditions are given which guarantee the existence of a prescribed number n of periodic solutions of each of the following two forms of Lienard's real differential equation: (I) d(2)x/dt(2) + f(x)dx/dt + x = 0, and (II) d(2)x/dt(2) + f(x)dx/dt + g(x) = 0. (Author)

AD-767 125/8GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
PERTURBATIONS IN FINITE-DIMENSIONAL SYSTEMS OF LINEAR INEQUALITIES AND EQUATIONS.
Technical summary rept.,
Stephen M. Robinson. Aug 73, 21p Rept no. MRC-TSR-1357
Contract DA-31-124-ARO(D)-462

Descriptors: (*Inequalities, Theorems), Matrix algebra, Set theory, Perturbation theory, Linear systems.
Identifiers: *Linear inequalities.

The paper deals with perturbations in mixed systems of linear inequalities and equations in finite-dimensional real linear spaces. The author shows that a certain condition is necessary and sufficient for good behavior of the solution sets of such systems under small perturbations in the data. This condition is computationally verifiable; it reduces to the classical full-row rank condition in the case of equations alone. In addition, quantitative estimates are given for the magnitudes of the changes in the solution sets in terms of the magnitudes of the perturbations. (Author)

AD-767 127/4GA PC$5.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
DIAGONAL NORM HERMITIAN MATRICES.
Technical summary rept.,
Hans Schneider, and R. E. L. Turner. May 73, 64p Rept no. MRC-TSR-1303
Contract DA-31-124-ARO(D)-462

Descriptors: (*Matrix algebra, Theorems), Set theory, Vector spaces, Topology, Number theory.

Identifiers: *Hermitian matrices, Duality theory, Matrix norms.

Conditions are given that a subset of the real diagonal matrices be the set of all diagonal norm Hermitians (or the set of all norm Hermitians) for some norm. It is also shown that almost all norms have only trivial Hermitians. (Author)

AD-767 129/0GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
A CANONICAL TRANSFORMATION NEAR A BOUNDARY POINT.
Technical summary rept.,
L. Sarason. Aug 73, 10p Rept no. MRC-TSR-1350
Contract DA-31-124-ARO(D)-462

Descriptors: (*Partial differential equations, *Transformations(Mathematics)), Boundary value problems, Vector spaces, Theorems.

A local homogeneous canonical transformation is constructed which straightens a curved boundary and freezes the coefficients of the principal part of a pseudo-differential operator in the neighborhood of a non-glancing ray. (Author)

AD-767 130/8GA PC$4.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
BIFURCATION, PERTURBATION OF SIMPLE EIGENVALUES AND LINEARIZED STABILITY.
Technical summary rept.,
Michael G. Crandall, and Paul H. Rabinowitz. 28 Sep 72, 42p Rept no. MRC-TSR-1295
Contracts DA-31-124-ARO(D)-462, N00014-69-A-0200-4022
Sponsored in part by National Science Foundation, Washington, D.C. Grant NSF-GP-32833.

Descriptors: (*Nonlinear differential equations, Functional analysis), Banach space, Matrix algebra, Set theory, Mapping(Transformations), Theorems.
Identifiers: Bifurcation theory, Eigenvalues.

The eigenvalue of minimum modulus of the Frechet derivative of a nonlinear operator is estimated along a bifurcating curve of zeroes of the operator. This result is applied to the study of a number of differential equations. Parallel results are developed for a class of nonlinear eigenvalue problems of positive type. (Author)

AD-767 131/6GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
UNIFORM CUBIC SPLINE INTERPOLATION OPERATORS IN (L SUB 1).
Technical summary rept.,
Franklin Richards. Jul 73, 10p Rept no. MRC-TSR-1307
Contract DA-31-124-ARO(D)-462

Descriptors: (*Interpolation, Functions), Polynomials, Theorems.
Identifiers: *Spline interpolation, Cubic spline technique.

The norms of the cubic cardinal and (uniform) periodic spline interpolation operators under the (L sub 1) norm are calculated. (Author)

AD-767 132/4GA PC$4.50/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
A METHOD FOR THE NUMERICAL SOLUTION OF TWO-POINT BOUNDARY VALUE PROBLEMS BASED ON THE USE OF VOLTERRA INTEGRAL.
Technical summary rept.,
H. Fujita, and L. B. Rall. May 73, 46p Rept no. MRC-TSR-1154
Contract DA-31-124-ARO(D)-462

Descriptors: (*Boundary value problems, Integration), Integral equations, Green's function, Matrix algebra, Numerical analysis, Theorems.
Identifiers: Volterra equations, *Two point boundary value problems, Numerical integration, Sturm-Liouville theory.

Suppose that a given two-point boundary value problem to be solved is a perturbation of one for which a considerable amount of analytic information is available, in particular, the Green's function of the unperturbed problem is known. In this case, one can construct an analytic method for the solution of the perturbed problem which involves only the solution of a Volterra integral equation. Discretization of this method, which is a version of the classical 'shooting' procedure, leads to a numerical technique for the solution of perturbed boundary value problems. Under suitable assumptions, convergence of the numerical method is established, and estimates are obtained for the rate of convergence. Attention is devoted to the cases in which the unperturbed differential operator is regular or mildly singular. Linear and nonlinear problems are considered. (Modified author abstract)

AD-767 134/0GA PC$4.75/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
THE SOLUTION OF MIXED BOUNDARY VALUE PROBLEMS INVOLVING A STRAIGHT LINE SEGMENT.
Technical summary rept.,
K. B. Ranger. Aug 73, 51p Rept no. MRC-TSR-1324
Contract DA-31-124-ARO(D)-462

Descriptors: (*Potential theory, *Boundary value problems), Partial differential equations, Integral transforms, Green's function, Conduction(Heat transfer), Fluid flow, Integration, Numerical analysis.
Identifiers: *Mixed boundary value problems, Dirichlet problem, Stokes law(Fluid mechanics), Helmholtz equation.

Boundary value problems of mixed type are considered for the line segment (needle) in which the model equation can be either electrostatics or heat conduction. Integral transformations are used which map mixed boundary conditions into Dirichlet conditions and the transformed problem can be solved by Green's function methods. Some applications are given to illustrate the method for heat conduction, Stokes flow and solutions of mixed boundary value problems for the Helmholtz equation involving a finite strip. (Author)

AD-767 135/7GA PC$3.50/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
AN EMBEDDING THEOREM FOR UNBOUNDED CONVEX SETS.
Technical summary rept.,
Stephen M. Robinson. May 73, 26p Rept no. MRC-TSR-1321
Contract DA-31-124-ARO(D)-264

Descriptors: (*Algebraic topology, *Convex sets), Vector spaces, Inequalities, Theorems, Groups(Mathematics).
Identifiers: *Imbeddings(Mathematics), Convex polytopes.

The author proves that the class of all closed convex sets in (R sup n) which share a common recession cone can be embedded as a convex cone in a generalized normed linear space. Algebraic and topological properties of this embedding are investigated. (Author)

AD-767 136/8GA PC$5.50/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
NOTES ON KARL VIND'S MANUSCRIPT: MEAN GROUPOIDS.
Technical summary rept.,
Brud Easton. Aug 73, 70p Rept no. MRC-TSR-1309
Contract DA-31-124-ARO(D)-462

Descriptors: (*Set theory, Theorems), Topology, Binary arithmetic, Mapping(Transformations), Groups(Mathematics).
Identifiers: Homomorphisms, Semigroup theory.

The report is a skeletal version of the first four chapters of Karl Vind's unpublished manuscript titled Mean Groupoids, University of Copenhagen (1969). His work (and the report) thoroughly develops the basic theory of totally preordered sets with special emphasis on totally preordered product sets. (Author)

AD-767 142/3GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
ON THE SOLUTION OF THE PARTIAL DIFFERENTIAL EQUATION THE PRODUCT FROM I=1 TO N(DELL SQUARED + (K SUB I, SUP 2))PSI=0,
G. S. Agarwal, A. J. Devaney, and D. N. Pattanayak. 22 Dec 72, 4p AROD-9407:22-P
Grant DA-ARO-D-31-124-72-G176
Prepared in cooperation with Stuttgart Univ. (West Germany). Institut fuer Theoretische Physik. Revision of report dated 15 Sep 72.
Availability: Pub. in Jnl. of Mathematical Physics, v14 n7 p906-908 Jul 73.

Descriptors: (*Partial differential equations, Integration), Green's function, Potential theory, Wave functions.
Identifiers: Elliptic differential equations, Helmholtz equation.

AD-767 149/8GA Reprint
California Univ Los Angeles
EXISTENCE OF DIRICHLET FINITE BIHARMONIC FUNCTIONS,
Mitsuru Nakai, and Leo Sario. 10 Nov 72, 38p AROD-9653:17-M
Grant DA-ARO-D-31-124-71-G20
International Standard Book No. 951-41-0083-3.
Availability: Pub. in the Annales Academiae Scientiarum Fennicai. Series A. I. Mathematics, v532 p3-35 1973.

Descriptors: (*Potential theory, Hilbert space), Green's function, Integrals, Partial differential equations, Theorems, Boundary value problems.
Identifiers: *Biharmonic functions, *Dirichlet problem, Riemannian manifolds, Existence theorems.

The existence of nonharmonic biharmonic functions on a noncompact Riemannian manifold is well known. A natural question is: what can be said about the existence of nonharmonic biharmonic functions with various boundedness properties. This is, in essence, the problem in the biharmonic classification of manifolds, which the authors propose to study. The existence and properties of Dirichlet finite nonharmonic biharmonic functions, i.e. biharmonic functions with square integrable gradients is investigated in the report. (Modified author abstract)

AD-767 156/3GA Reprint
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
A NOTE ON THE EPSILON ENTROPY OF MONOTONE FUNCTIONS IN THE LEVY NORM,
Peter Elias. 1973, 8p AROD-8143:2-RT
Contract DAHC04-69-C-0042
Availability: Pub. in Advances in Mathematics, v10 n2 p321-325 Apr 73.

Descriptors: (*Distribution functions, Entropy), Probability density functions, Inequalities, Theorems, Approximation(Mathematics).
Identifiers: *Monotone functions.

The epsilon entropy of the class F* of real-valued monotone functions from (0,1) to (0,1) in the usual Chebyshev norm is infinite, due to the discontinuities in some of the f belongs to F*. One of the class of norms introduced by P. Levy for analyzing the convergence of distribution functions gives finite epsilon entropy equivalent to (1/epsilon). There is an obvious extension to the class F*(AB) of monotone functions from (0,A) to (0,B). (Author)

AD-767 174/6GA Reprint
Florida State Univ Tallahassee Dept of Statistics
A DISTRIBUTION-FREE NORMAL SCORES TEST FOR ORDERED ALTERNATIVES IN THE RANDOMIZED BLOCK DESIGN,
Walter R. Pirie, and Myles Hollander. Feb 72, 3p
Contract NONR-988(08), Grant NSF-GP-5114
Revision of report dated Aug 71.
Availability: Pub. in Jnl. of the American Statistical Association, v67 n340 (Theory and Methods Section) p855-857 Dec 72.

Descriptors: (*Experimental design, *Combinatorial analysis), Statistical tests, Distribution functions, Tables.
Identifiers: *Block design, Nonparametric statistics.

The authors introduce a normal scores test for ordered alternatives among k treatments in the randomized block design. For k=2 or 3, the test is equivalent to a standard test due to Page. For k > cr = 4, the test differs from Page's and is often more efficient. As k nears infinity, the Pitman asymptotic relative efficiency of the normal scores test compared to Page's test tends to infinity for uniform and exponential populations. For normal, uniform and exponential populations, this efficiency exceeds 1 for k > or = 4. The authors present a table of .01, .05, and .10 critical values for k = 4, n = 1(1)10 and k = 5, n = 1(1)5. (Author)

AD-767 175/3GA Reprint
Florida State Univ Tallahassee
SEQUENTIAL ONE-SAMPLE GROUPED SIGNED RANK TESTS FOR SYMMETRY: MONTE CARLO STUDIES,
Harrison D. Weed, Jr., and Ralph A. Bradley. 31 Jan 72, 39p
Contract Nonr-988(08)
Supersedes report dated Feb 71, AD-721 339.
Availability: Pub. in J. Statist. Comput. Simul., v2 p99-137 1973.

Descriptors: (*Statistical tests, *Sequential analysis), (*Monte Carlo method, Statistical tests), Sampling, Distribution functions, Tables, Simulation.
Identifiers: Ranking, Lehmann alternatives, Order statistics.

Monte Carlo studies of sequential, one-sample, signed rank tests developed earlier by the authors are reported. The basic tests are the ssr-test based on the sums of signed ranks and the csr-test based on the observed configurations of signed ranks in both of which groups of N observations are obtained sequentially with signed ranks obtained within groups. The mcsr-test is also considered and it is a modification of the csr-test in which signed ranks are obtained anew for the totality of observations available at each stage of the sequential process. The alternative hypothesis in each case is stated in the class of Lehmann alternatives.

AD-767 189/4GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Engineering Science Operations
PSEUDO STATE MEASUREMENTS APPLIED TO RECURSIVE NONLINEAR FILTERING.
Rept. for Jul 72-Jan 73,
David W. Whitcombe. 30 Nov 72, 33p Rept no. TR-0073(3115)-2 SAMSO-TR-73-265
Contract F04701-72-C-0073

Descriptors: (*Control systems, Mathematical models), Stochastic processes, Matrix algebra, Statistical analysis, Partial differential equations.
Identifiers: *Nonlinear filtering, Markov processes, Control theory, Recursive filters, Kalman filters.

Pseudo state measurements are constructed to make the measurement (geometry) model linear in the state. In the past, linear measurements have often proved to give better state estimates than nonlinear measurements. They are nonlinear functions of the actual measurement model bias parameters and are constructed to be linear functions of the state variables or to vanish in the absence of model or measurement error. Some examples of constructing pseudo state measurements are given in the paper. Recursive filter equations are derived using the pseudo state measurements and including colored (Markov) measurement noise and unestimated state and measurement model parameters. The filter estimates minimize the usual weighted least squares cost function with correlated state and pseudo state measurements. The filter is linear by construction. Higher order partial derivatives, if retained, would appear only in the computation of error variance and covariance matrices. (Author)

AD-767 223/1GA PC$4.75/MF$1.45
Army Electronics Command Fort Monmouth N J
A METHOD OF COMPUTING SPHERICAL BESSEL FUNCTIONS OF COMPLEX ARGUMENT WITH TABLES.
Research and development technical rept.,
W. J. Lentz. Sep 73, 160p* Rept no. ECOM-5509

Descriptors: (*Bessel functions, Tables), Continued fractions, Complex numbers.
Identifiers: Mathematical tables, Computation.

Ten-place tables of spherical Bessel functions of complex argument with real and imaginary values from 0.001 to 1000 in varying increments for 100 consecutive orders are presented. The method used to generate these tables is based on a continued fraction representation of the ratio of Bessel functions of consecutive order. This method retains a high degree Bessel functions of consecutive order. This method retains a high degree of accuracy in a finite digit machine, incorporates a terminating condition, is fast and simple, and is versatile enough to find wide application as a method for continued fractions in general. (Author)

AD-767 292/6GA PC$2.75/MF$1.45
North Carolina State Univ Raleigh
RESEARCH ON DIFFERENTIAL EQUATIONS AND GENERALIZED FUNCTIONS.
Final rept. 1 Sep 72-31 Aug 73,
Raimond A. Struble. 5 Sep 73, 8p AROD-10647:20-M
Grant DA-ARO-D-31-124-72-G192

Descriptors: (*Differential equations, Banach space), (*Neutron transport theory, Scientific research), Cauchy problem, Operators(Mathematics), Boundary value problems.

A research project on the topics of differential equations and operator equations, generalized functions, and neutron transport and diffusion systems is briefly summarized. (Author)

AD-767 314/8GA PC$3.50/MF$1.45
Ohio State Univ Columbus Dept of Geodetic Science
STEPWISE AND SEQUENTIAL COLLOCATION,
Helmut Moritz. Jul 73, 51p Rept nos. DGS-203, Scientific-10 AFCRL-TR-73-0432
Contract F19628-72-C-0120

Descriptors: (*Gravity, Statistical analysis), Information theory, Least squares method, Noise, Matrix algebra, Mathematical prediction.
Identifiers: Kalman filters, Parameter estimation, Signal processing, *Gravimetric geodesy, *Collocation(Mathematics), Covariance.

In stepwise collocation, the estimation procedure is split up into two steps, corresponding to a partitioning of the covariance matrix to be inverted. Formulas for signal and parameter estimates and for their error covariances are derived and interpreted statistically. Stepwise adjustment by parameters and by conditions is exhibited as special cases of stepwise collocation. Sequential collocation is an extension of the procedure so as to comprise several steps. Finally, the relation between sequential collocation and Kalman filtering is considered in some detail. (Author)

AD-767 345/2GA PC$2.75/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Statistics
MONOTONE BOUNDS ON THE CHI-SQUARED APPROXIMATION TO THE DISTRIBUTION OF PEARSON'S X SQUARED STATISTICS.
Technical research rept.,
Donald R. Jensen. 15 Sep 73, 13p Rept no. VPI-RR-5
Contract N00014-72-A-0136-0003

Descriptors: (*Distribution functions, *Statistical tests), Sampling, Probability density functions, Theorems.
Identifiers: Chi square test, Goodness of fit tests, Hypotheses.

Monotone bounds, depending on the underlying multinomial probabilities and the sample size, are given for the chi-squared approximation to the distribution of Pearson's statistic for goodness of fit for simple hypotheses. These bounds apply to the distribution of a single statistic and to the joint distribution of two statistics associated with the margins of a two-way table, in both the central and noncentral cases.

AD-767 374/2GA PC$2.75/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
CORRELATED SIMULATION EXPERIMENTS.
Technical rept.,
George S. Fishman. Sep 73, 17p Rept no. TR-28-3
Contract N00014-67-A-0097-0028

Descriptors: (*Experimental design, Sampling), (*Simulation, Correlation techniques), Stochastic processes, Analysis of variance, Least squares method, Combinatorial analysis.
Identifiers: *Response surface analysis.

The paper studies the effects of using correlated random number streams in replications of a simulation experiment in which output is to be related to input by linear and quadratic response surfaces. For the linear case, it is shown that either positively or negatively correlated streams produce a smaller generalized variance for the least-squares estimates that occur when the streams are independent. Although the prediction variance is small with negatively correlated steams, positively correlated streams produce a smaller variance for the estimated slope. In the quadratic case it is shown that of twenty seven possible input correlation designs only six guarantee a smaller generalized variance. Only one of these produces a smaller prediction variance. However, no plan will guarantee a smaller slope variance. In the quadratic case one often wants the slope variance to be as small as possible since the objective of the study may be to determine where the maximum or minimum response occurs in terms of the input. (Author)

AD-767 381/7GA PC$2.75/MF$1.45
Texas Univ Austin Center for Numerical Analysis
REMARKS ON PERTURBATIONS IN LINEAR INEQUALITIES,
James W. Daniel. Sep 73, 5p Rept no. CNA-77
Contract N00014-67-A-1026-0015

Descriptors: (*Inequalities, Theorems), Perturbation theory, Matrix algebra.
Identifiers: *Linear inequalities.

A unified approach is presented for the study of the behavior of the solution sets of finite dimensional systems of linear equalities and inequalities subjected to perturbations. Results of Robinson and of Daniel are unified and slightly extended. (Author)

AD-767 393/2GA PC$3.00/MF$1.45
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
IDENTIFICATION IN CONTROL AND ECONOMETRICS; SIMILARITIES AND DIFFERENCES.
Interim technical rept.,
R. K. Mehra. Jul 73, 10p Rept no. TR-647
Contract N00014-67-A-0298-0006
Sponsored in part by Army Research Office, Air Force Office of Scientific Research.

Descriptors: (*Adaptive control systems, Mathematical models), (*Economics, Adaptive control systems), Identification systems, Stochastic processes, Regression analysis, Equations of motion, Matrix algebra, Time series analysis, Least squares method.
Identifiers: *Economic models, Parameter estimation, Maximum likelihood estimation, *Control theory, Automatic control, *Econometrics.

The report attempts to bridge the gap between the economic and the control literatures on the subject of system identification and parameter estimation. It is pointed out that the emphasis in the economic literature is on large simultaneous equation models and linear estimation techniques, whereas the emphasis in the control literature is on state vector and transfer function models, on problems due to partial state observations and nonlinear estimation techniques. Since a step in the direction of easier communication between researchers in the two fields would be the use of a common model, the state-vector model of control which has already been used in several economic studies is proposed as a unifying link. The relationship of the state vector model to the simultaneous equation model and the role of process and measurement noise in the econometric context are discussed. Complete results on the identifiability of state-vector models along with a stepwise two-stage least squares method for model structure determination and a maximum likelihood method for parameter estimation are given. The problems of closed-loop system identification and input design are also briefly discussed. (Author)

AD-767 398/1GA PC$4.50/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
A METHOD FOR THE NUMERICAL SOLUTION OF TWO-POINT BOUNDARY VALUE PROBLEMS BASED ON THE USE OF VOLTERRA INTEGRAL OPERATORS.
Technical summary rept.,
H. Fujita, and L. B. Rall. May 73, 47p Rept no. MRC-TSR-1154
Contract DA-31-124-ARO(D)-462

Descriptors: (*Boundary value problems, Numerical analysis), Integral equations, Green's function, Integration, Theorems, Perturbation theory, Convergence.
Identifiers: *Two point boundary value problems, *Volterra equations, Numerical integration.

A numerical method is presented for the solution of boundary value problems by reduction to Volterra integral equations. (Author)

AD-767 406/2GA Reprint
Johns Hopkins Univ Baltimore Md Dept of Statistics
APPROXIMATING CIRCULANT QUADRATIC FORMS IN JOINTLY STATIONARY GAUSSIAN TIME SERIES,
Leon Jay Gleser, and Marcello Pagano. 30 May 72, 14p AFOSR-TR-73-1710
Contract F44620-70-C-0066
Revision of report dated 7 Dec 71. Prepared in cooperation with the State Univ. of New York, Buffalo.
Availability: Pub. in the Annals of Statistics, v1 n2 p322-333 1973.

Descriptors: (*Time series analysis, Approximation(Mathematics)), Matrix algebra, Stochastic processes, Theorems.
Identifiers: *Quadratic forms, Stationary processes, Periodograms.

AD-767 407/0GA Reprint
Johns Hopkins Univ Baltimore Md Dept of Statistics
ON A NEW CLASS OF BOUNDS FOR THE DISTRIBUTION OF QUADRATIC FORMS IN NORMAL VARIATES,
Leon Jay Gleser. May 71, 7p AFOSR-TR-73-1708
Contract F44620-70-C-0066
Revision of report dated Nov 69.
Availability: Pub. in the Jnl. of the American Statistical Association, v67 n339 p655-659 Sep 72.

Descriptors: (*Analysis of variance, Distribution functions), Matrix algebra, Random variables, Theorems.
Identifiers: *Quadratic forms, Normal density functions.

Except in special cases, the distribution of a quadratic form Q in the normal random vector y cannot be expressed in closed form. However, bounds on the cumulative distribution of Q have been obtained by many authors. The article derives a new class of such bounds by means of a certain mixture representation for the distribution of Q. It is shown how the results apply to the problem of finding the distribution of ratios of independent quadratic forms in normal variates. (Author)

AD-767 441/9GA Reprint
California Univ Santa Barbara Dept of Mathematics
A RELATION BETWEEN THE PERMANENTAL AND DETERMINANTAL ADJOINTS,
Marvin Marcus, and Russell Merris. 10 Jun 71, 5p AFOSR-TR-73-1862
Grant AF-AFOSR-698-67
Revision of report dated 12 Oct 70.
Availability: Pub in Jnl. of the Australian Mathematical Society, v15 pt3 p270-271 1973.

Descriptors: (*Matrix algebra, *Inequalities), Stochastic processes, Theorems.
Identifiers: *Hermitian matrices, Eigenvalues.

The paper contains an inequality relating the permanental and determinantal adjoint of a positive-definite Hermitian matrix. The result provides a partial solution to a conjecture of Djokovic. (Author)

AD-767 444/3GA Reprint
George Washington Univ Washington D C Dept of Statistics
AN APPLICATION OF THE MINIMUM DISCRIMINATION INFORMATION ESTIMATE TO COMPUTER LOG-LIKELIHOOD RATIOS,
S. Kullback, and E. L. Melnick. 8 May 72, 7p AFOSR-TR-73-1752
Grant AF-AFOSR-1513-68
Prepared in cooperation with New York Univ., N. Y.
Availability: Pub. in Jnl. of Applied Probability, v10 p469-474 1973.

Descriptors: (*Information theory, *Stochastic Processes), Measure theory.
Identifiers: Poisson processes, Estimation theory.

In the paper the minimum discrimination information estimate is used to compute the log-likelihood ratio or logarithm of the Radon-Nikodym derivative ln(dP1/dP2) when the stochastic process (x(t), t belongs to T) has either the probability measure P1 or P2. One example tests the mean value function of Gaussian processes. The other tests the mean value function of a continuous time Poisson process. (Author)

AD-767 445/0GA Reprint
George Washington Univ Washington D C Dept of Statistics
PARTITIONING SECOND-ORDER INTERACTION IN THREE-WAY CONTINGENCY TABLES.
Interim rept.,
Solomon Kullback, and Marian Fisher. 1973, 15p AFOSR-TR-73-1873
Grant AF-AFOSR-1513-68
Prepared in cooperation with the National Heart and Lung Inst., Bethesda, Md.
Availability: Pub. in the Jnl. of the Royal Statistical Society Series C Applied Statistics, v22 n2 p172-184 1973.

Descriptors: (*Statistical analysis, Tables), Biometry, Statistical tests, Respiratory diseases.
Identifiers: *Contingency tables, Maximum likelihood estimation.

The principle of minimum discrimination information estimation and associated techniques are used to consider the partitioning of a three-way contingency table when second-order interaction is present. Within the partitioned model a sub-hypothesis of logit linearity is also studied. Computational procedures uses a generalized iterative scaling algorithm of Darroch and Ratcliff.

AD-767 450/0GA Reprint
Colorado Univ Boulder Dept of Mathematics
TRUNCATION ERROR BOUNDS FOR CONTINUED FRACTIONS AND PADE APPROXIMANTS,
William B. Jones. 1972, 7p AFOSR-TR-73-1865
Grant AF-AFOSR-1888-70
Availability: Pub. in Proceedings of a Conference on Pade Approximants and Theor Applications, held at Kent Univ., Canterbury (England), on Jul 72.

Descriptors: (*Continued fractions, Approximation(Mathematics)), Complex numbers, Numerical analysis, Accuracy, Errors.
Identifiers: *Pade approximants, *Truncation errors.

A brief review is given of results on a posteriori estimate of the truncation error of approximations based on continued fractions and the Pade table. In summarizing the results of various authors employing widely different methods, it is seen that the notion of simple sequences forms a unifying thread. In each case truncation error bounds are obtained by showing that the approximants form a simple sequence and determining the simple sequence constant. (Author)

AD-767 451/8GA Reprint
Colorado Univ Boulder Dept of Mathematics
RECENT APPROACHES TO CONVERGENCE THEORY OF CONTINUED FRACTIONS.
Interim rept.,
W. J. Thron. 1973, 7p AFOSR-TR-73-1866
Grant AF-AFOSR-1888-70
Availability: Pub. in the Pade Approximants and Their Applications, New York, 1973.

Descriptors: (*Continued fractions, Convergence), Difference equations, Transformations(Mathematics), Complex numbers.

The report is a very brief survey of recent work in convergence theory of continued fractions. Methods involving the condition (s sub n)(V sub n) subset of (V sub (n-1)) are emphasized. (Author)

AD-767 463/3GA Reprint
Oklahoma Univ Research Inst Norman
A CONTINUITY PROPERTY OF PRINCIPAL SOLUTIONS OF LINEAR HAMILTONIAN DIFFERENTIAL SYSTEMS,
William T. Reid. 21 Aug 71, 16p AFOSR-TR-73-1864
Grant AF-AFOSR-2069-71
Availability: Pub. in Scripta Mathematica, v29 n3-4 p337-350 1973.

Descriptors: (*Differential equations, Hamiltonian), Matrix algebra, Theorems.
Identifiers: *Continuity(Mathematics).

For a linear vector Hamiltonian differential system on an interval that is disconjugate on a subinterval (c, b sub 0) or (a sub 0, c), the concept of a principal solution of the system at the respective endpoint b sub 0 or a sub 0 enables one to characterize the point or points on (a sub 0, b sub 0) conjugate to this endpoint. The present paper established a result on the continuity of such principal solutions, as functions of the coefficients of the differential system. In particular, the result of this paper has been used by the author in the consideration of a boundary problem of Sturmian type on a noncompact interval. (Modified author abstract)

AD-767 470/8GA Reprint
University of Southern California Los Angeles Dept of Aerospace Engineering
NEW METHODS FOR NONLINEAR FILTERING,
R. S. Bucy, C. Hecht, and K. D. Senne. 1973, 53p AFOSR-TR-73-1711
Grant AF-AFOSR-2141-71
Prepared in cooperation with TRW Systems, Redondo Beach, Calif., and Massachusetts Inst. of Tech., Lexington. Lincoln Lab. text in English; attached summary in French.
Availability: Pub. in Revue Francaise d'Automatique Informatique et de Recherche Operationnelle, J-1 p3-54 Feb 73.

Descriptors: (*Adaptive control systems, Mathematical models), Nonlinear systems, Phase-locked systems, Nonlinear differential equations, Stochastic processes, Optimization.
Identifiers: *Nonlinear filtering, Kalman-Bucy filters, Stochastic differential equations, Signal processing, Control theory.

The article concerns the realization of optimal non-linear filters using 3rd generation digital computers as the means of synthesis. In particular the synthesis of an optimal phase demodulator is considered which gives a 2 to 3 db error performance improvement of the classical phase lock loop. Finally some alternate synthesis schemes are discussed. (Author)

AD-767 484/9GA Reprint
California Univ Berkeley Coll of Engineering
A DUAL METHOD FOR OPTIMAL CONTROL PROBLEMS WITH INITIAL AND FINAL BOUNDARY CONSTRAINTS,
O. Pironneau, and E. Polak. 20 May 72, 17p AFOSR-TR-73-1893
Grant AF-AFOSR-1488-68
Revision of report dated 25 May 71.
Availability: Pub. in SIAM Jnl. of Control, v11 n3 p534-549 Aug 73.

Descriptors: (*Adaptive control systems, Mathematical models), Algorithms, Inequalities, Banach space, Hilbert space, Theorems, Optimization.
Identifiers: *Control theory, Automatic control.

The paper presents two new algorithms belonging to the family of dual methods of centers. The first can be used for solving fixed time optimal control problems with inequality constraints on the initial and terminal states. The second one can be used for solving fixed time optimal control problems with inequality constraints on the initial and terminal states and with affine instantaneous inequality constraints on the control. Convergence is established for both algorithms. Qualitative reasoning indicates that the rate of convergence is linear. (Author)

AD-767 491/4GA Reprint
California Univ Berkeley Coll of Engineering
CANCELLATIONS IN MULTIVARIABLE CONTINUOUS-TIME AND DISCRETE-TIME FEEDBACK SYSTEMS TREATED BY GREATEST COMMON DIVISOR EXTRACTION,
Charles A. Desoer, and J. D. Schulman. 22 Jan 73, 3p AFOSR-TR-73-1890
Contract F44620-71-C-0087
Availability: Pub. in IEEE Transactions on Automatic Control, vAC18 n4 p401-402 Aug 73.

Descriptors: (*Adaptive control systems, Mathematical models), Transfer functions, Matrix algebra, Feedback, Complex variables.
Identifiers: Continuous time systems, Discrete time systems, *Control theory, Automatic control.

The paper considers a multivariable system with proper rational matrix transfer functions in the forward and feedback branches, respectively. It develops a strictly algebraic procedure to obtain polynominals whose zeros are the poles of the matrix transfer functions from input to output, and from input to error. (Modified author abstract)

AD-767 506/9GA Reprint
California Univ Santa Barbara Dept of Mathematics
DERIVATIONS, PLUCKER RELATIONS, AND THE NUMERICAL RANGE,
Marvin Marcus. 25 Sep 72, 15p AFOSR-TR-73-1704
Grant AF-AFOSR-2164-72
Availability: Pub. in Indiana Univ. Mathematics Jnl., v22 n12 p1137-1149 1973.

Descriptors: (*Matrix algebra, Theorems), Vector spaces, Convex sets, Combinatorial analysis, Complex numbers, Theorems.

AD-767 507/7GA Reprint
California Univ Santa Barbara Dept of Mathematics
IMAGES OF BILINEAR SYMMETRIC AND SKEW-SYMMETRIC FUNCTIONS,
Marvin Marcus, and M. Shafqat Ali. 1 Oct 71, 9p AFOSR-TR-73-1674
Grant AF-AFOSR-2164-72
Availability: Pub. in Illinois Jnl. of Mathematics, v17 n3 p505-512 Sep 73.

Descriptors: (*Matrix algebra, Vector spaces), Mapping(Transformations), Theorems.

The paper is concerned with obtaining non-trivial upper bounds on the dimension of the range of a skew-symmetric or symmetric bilinear function when the range is assumed to be a vector space. (Author)

AD-767 511/9GA Reprint
Illinois Univ Urbana Dept of Mathematics
AN ASYMPTOTICALLY EFFICIENT, SEQUENTIAL EQUIVALENT OF THE T-TEST,
L. Weiss, and J. Wolfowitz. Mar 72, 7p AFOSR-TR-73-1678
Grant AF-AFOSR-1947-70
Prepared in cooperation with Cornell Univ., Ithaca, N.Y. Grant NSF-GP-21184. Revision of report dated Dec 71.
Availability: Pub. in The Jnl. of the Royal Statistical Society, serB (Methodological), v34 n3 p456-460 1972.

Descriptors: (*Statistical tests, *Sequential analysis), Decision theory, Sampling, Random variables, Asymptotic series.
Identifiers: *T test, Asymptotic efficiency.

Let X(1), X(2), ..., be independent, normally distributed chance variables, each with mean mu and variance chi square, both unknown to the statistician. Let it be required to test sequentially the hypothesis that (make a decision between) mu = mu 1 against the alternative mu = mu 2, mu 1 < mu 2. When the sample size is fixed the Student t-test is usually used for this purpose. In the present paper the authors give a sequential procedure for performing this test which is consistent and asymptotically efficient as (mu 2 - mu 1) approaches zero. (Author)

AD-767 513/5GA Reprint
Yale Univ New Haven Conn Dept of Engineering and Applied Science
STRUCTURAL INVARIANTS OF LINEAR MULTIVARIABLE SYSTEMS,
A. S. Morse. 31 Jan 72, 22p AFOSR-TR-73-1852
Grant AF-AFOSR-2211-72
Availability: Pub. in SIAM Jnl. of Control, v11 n3 p446-465 Aug 73.

Descriptors: (*Matrix algebra, Invariance), Vector spaces, Feedback, Control systems, Theorems.
Identifiers: Decomposition method.

The article identifies some of the structural properties of the matrix triple (C,A,B) which remain invariant under various transformation groups. (Modified author abstract)

AD-767 516/8GA Reprint
Stanford Univ Calif Dept of Mathematics
ON THE FUNDAMENTAL HYPOTHESIS OF HUNT PROCESSES,
Kai Lai Chung. 10 Apr 72, 13p AFOSR-TR-73-1747
Contract F44620-67-C-0049
Revision of report dated 16 Mar 71.
Availability: Pub. in Istituto Nazionale di Alta Mathematica Symposia Mathematica, v9 p43-52 1972.

Descriptors: (*Stochastic processes, Measure theory), Integral transforms, Theorems.
Identifiers: *Markov processes, Hypotheses, Hunt processes.

New hypotheses involving predictable time and moderate Markov property are introduced and their relations to the Hunt-hypotheses are investigated. An equation connecting the strict past field and present state with the usual (F sub T) is given. (Author)

AD-767 552/3GA PC$3.75/MF$1.45
California Univ Berkeley Operations Research Center
A GENERALIZED GRADIENT IN OPTIMAL CONTROL.
Research rept.,
David D. Barnett. Jul 73, 93p Rept no. ORC-73-12
Contract DA-31-124-ARO(D)-331, Grant NSF-GP-30961

Descriptors: (*Adaptive control systems, Mathematical models), Dynamic programming, Equations of motion, Partial differential equations, Saddle point method, Matrix algebra, Iterations, Digital computers, Optimization, Theses.
Identifiers: *Automatic control, *Control theory, Continuous time systems, Parametric programming, State space method.

Gradient methods or methods of steepest descent in control-space have been found to be quite useful for the numerical solution of a large class of problems in optimal control. However, there is a large class of problems for which these methods have not been successful. To deal with this larger class of problems, a generalized gradient method is proposed. The convergence rate of this method is analyzed for a certain class of problems and the analysis is verified numerically. The analysis is then used to suggest improvements in the basic algorithm. (Author)

AD-767 608/3GA PC$3.25/MF$1.45
Johns Hopkins Univ Baltimore Md Dept of Statistics
A NOTE ON BOX'S GENERAL METHOD OF APPROXIMATION FOR THE NULL DISTRIBUTIONS OF LIKELIHOOD CRITERIA,
Leon J. Gleser, and Ingram Olkin. Aug 72, 21p AFOSR-TR-73-1709
Contract F44620-70-C-0066
Prepared in cooperation with Stanford Univ., Calif. Grant NSF-GP-32326X.

Descriptors: (*Multivariate analysis, Distribution functions), Statistical tests, Matrix algebra, Random variables, Moments, Theorems, Asymptotic series.
Identifiers: Gamma function, Likelihood ratio test, Benoulli polynomials.

Many multivariate test statistics (such as the likelihood ratio test for MANOVA) have null distributions whose moments are proportional to ratios of products of gamma functions. For any random variable W, 0 < or = W < or = 1, whose moments have the above-mentioned form, Box proposed an asymptotic expansion for the c. d. f. of W, which provides an accurate method for determining the critical constants defining rejection regions for the multivariate tests mentioned above. Although the method is useful, the calculations needed to obtain the coefficients in each asymptotic expansion must be obtained ab initio, and almost always involve cumbersome algebraic manipulations. In the present study, simplified algorithms are given for calculating the coefficients of the asymptotic expansion in the general case. In a certain special case (which includes the null distributions of the likelihood ratio criteria for MANOVA and for testing the independence among sets of variates), explicit formulas are derived for these coefficients. (Modified author abstract)

AD-767 620/8GA PC$5.50/MF$1.45
Texas Univ Austin Electronics Research Center
ADAPTIVE CONTROL OF LINEAR STOCHASTIC SYSTEMS.
Technical rept.,
Triveni N. Upadhyay, and Demetrios G. Lainiotis. 20 May 73, 208p Rept no. TR-148 AFOSR-TR-73-1645
Contract F44620-71-C-0091

Descriptors: (*Adaptive control systems, Mathematical models), (*Economics, Adaptive control systems), Stochastic processes, Dynamic programming, Probability density functions, Matrix algebra, United States, Stability, Curve fitting, Graphics, Linear systems.
Identifiers: *Control theory, Automatic control, Stochastic control, Applications of mathematics, *Economic models, Maximum principle, Economic analysis.

The problem of controlling unknown stochastic systems stems from the need that in many practical design situations, the engineer does not have at his disposal sufficient data to derive a complete mathematical model of the process he endeavors to control. Instead, uncertainty may exist with respect to certain parameters in the system description. In this study, the unknown parameters in the system are assumed to be constant and are modeled as random variables. Bayesian approach is used, in that it is assumed that the a-priori probability distribution for the unknown parameters is available. The adaptive-control algorithm developed in this research was used to study economic stabilization for a short-term economic model of the post-Korean War U. S. economy. This is a linear 28-state variable model with three control variables. The experimental results demonstrate that the adaptive-control approach is valuable as a tool for policy planning and is helpful in understanding the dynamic structure of econometric models. (Modified author abstract)

AD-767 623/2GA PC$3.00/MF$1.45
George Washington Univ Washington D C Dept of Statistics
LOWER TAIL PERCENTAGE POINTS FOR THE STATISTICS (D SUB N) AND (C SUB N).
Technical rept.,
M. A. Stephens. 29 Aug 73, 18p Rept no. TR-10
Contract N00014-67-A-0214-0015

Descriptors: (*Statistical tests, Theorems), Sampling, Random variables, Distribution functions, Approximation(Mathematics).
Identifiers: Goodness of fit tests, Kolmogorov-Smirnov test.

Certain goodness-of-fit tests involve transformations to produce a set of values which should be uniformly distributed when the null hypothesis is true. When it is not true, it is generally assumed that a test for uniformity of the final observations will give large values of the Kolmogorov or similar test statistics. This is not however always correct; the final observations may turn out to be very evenly spaced. The paper illustrates such situations, and gives tastes of the lower tail of the Kolmogorov statistic and a closely-related statistic, for use in tests in the situation described. (Author)

AD-767 625/7GA PC$3.75/MF$1.45
Louisiana State Univ Baton Rouge Dept of Chemical Engineering
STUDIES IN DIGITAL AUTOMATA.
Final rept.,
Cecil L. Smith. 31 Aug 73, 33p AFOSR-TR-73-1685
Contract F44620-68-C-0021

Descriptors: (*Adaptive control systems, Mathematical models), Analog-digital computers, Digital computers, Stochastic processes, Trajectories, Guidance, Algorithms, Optimization.
Identifiers: Automata theory, *Control theory, Automatic control, Themis project, Stochastic control, Hybrid simulation, Digital automata.

The report presents studies which were conducted in numerous areas of control systems and digital processes. The studies may be summarized in four major areas: Hybrid Computation and Simulation; System Identification; Control Algorithm Synthesis and Tuning; and Optimal Control.

AD-767 643/0GA PC$3.50/MF$1.45
Naval Research Lab Washington D C
THE THEORY AND CONSTRUCTION OF MULTIVARIATE GAUSSIAN SURFACES.
Final rept.,
Luise S. Schuetz, and George G. Zipfel, Jr. 31 Aug 73, 58p Rept no. NRL-7588

Descriptors: (*Multivariate analysis, Surfaces), Stochastic processes, Fourier analysis, Confidence limits, Probability density functions, Correlation techniques, Computer programs, Milling machines.
Identifiers: Fast Fourier transform, Fourier transformation, RANMILL computer code, CDC 3800 computers, *Numerical control.

A procedure has been developed for the construction of random rough surfaces with statistics which approximate the ideal of multivariate Gaussian statistics with a prescribed spectrum. Estimates of the deviation of the sample surfaces from the ideal ensemble statistics are made. The procedure uses a fast-Fourier-transform algorithm to produce a numerical surface which is then used to construct a physical realization of the surface via a numerically controlled milling machine. The resulting surface is one which can be used in scattering experiments, and the degree of conformity of its statistics to those of the ideal is well understood. The use of these surfaces will eliminate a major source of uncertainty in the interpretation of controlled experiments. (Author)

AD-767 655/4GA PC$7.25/MF$1.45
Naval Postgraduate School Monterey Calif
THE GENERATION OF GAMMA DISTRIBUTED VARIATES AND AN INVESTIGATION OF A TREND TEST FOR THE GAMMA RENEWAL PROCESS.
Master's thesis,
David Walter Robinson. Jun 73, 104p

Descriptors: (*Statistical processes, Analysis of variance), Distribution functions, Random variables, Statistical tests, Computer programs, Compilers, Theses.
Identifiers: Renewal processes, Normal density functions, FORTRAN, FORTRAN 4 programming language, Computerized simulation.

In testing the hypothesis that there is no monotone trend in a gamma renewal process, the use of the statistic Y(J) = Y(2J)/Y(1J), where Y(1J) = the summation from i=1 to J of X(i) and Y(2J) = the summation from i=1 to J of S(i), is investigated. The mean and variance of Y(J) is developed as a function of J and it is shown that Y(J) is asymptotically normal as J approaches infinity for the gamma renewal process. A high-speed, theoretically exact gamma pseudo-random variate generator is developed, tested and compared with other known techniques. The generator is then used to obtain the distribution of Y(J) through digital computer simulation for small and moderate values of J. (Author)

AECL-4080/GA PC$4.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
GUIDE TO MAKING STATISTICAL TESTS WITH SMALL SAMPLES.
R. G. Jarvis. Feb 73, 45p
U.S. Sales Only.

Descriptors: (*Sampling, *Statistics), Testing.

For abstract, see NSA 28 03, number 07649.

AECL-4311/GA PC$4.50/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
FORSIM: A FORTRAN ORIENTED SIMULATION PACKAGE FOR THE TRANSIENT SOLUTION OF SIMULTANEOUS ORDINARY DIFFERENTIAL EQUATIONS.
M. B. Carver. Feb 73, 49p
U.S. Sales Only.

Descriptors: (*Differential equations, Computer codes), (*Computer codes, *F codes), Fortran, Numerical solution.

For abstract, see NSA 28 02, number 04972.

COM-73-50784/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PERTURBATION SOLUTION OF THE KIRKWOOD-SALSBURG EQUATION.
Final rept.,
William Klein. 1973, 11p
Pub. in Jnl. of Mathematical Physics, v14 n8 p1049-1059 Aug 73.

Descriptors: (*Convergent series, Equations), Distribution functions.
Identifiers: *Kirkwood-Salsburg equation.

A formal series solution to the Kirkwood-Salsburg equation and its radius of convergence are derived. This solution leads naturally to the establishment of an approximate hierarchy of equations for the distribution functions which needs no closure. The asymptotic behavior of the solutions to this approximate hierarchy is studied as well as the behavior of the derivatives of the pair function with respect to the interparticle distance.

COM-73-50785/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STRUCTURE ANALYSIS IN TWO-WAY TABLES OF MEASUREMENT DATA.
Final rept.,
John Mandel. 1973, 9p
Pub. in Proceedings of Session of the International Statistical Institute, (39th), Vienna, Austria, 20-30 Aug 73, v2 p697-705.

Descriptors: (*Analysis of variance, Tables(Data)), Partitions(Mathematics), Degrees of freedom.

A general procedure is presented for the elucidation of the structure of a two-way table. The method is based on a partitioning of the row by column interaction into a sum of multiplicative terms. To this partitioning corresponds a breakdown of the sum of squares of interaction and of the corresponding degrees of freedom in the analysis of variance table. By studying the interrelationships of the parameters occurring in the model, the internal structure of the data can generally be ascertained. An illustrative example taken from an actual study is discussed.

COO-1469-228/GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
EFFECT OF VARIABLE MESH SIZE ON THE STABILITY OF MULTISTEP METHODS.
C. W. Gear. Apr 73, 36p UIUCDCS-R-73-570
Contract AT(11-1)-1469

Descriptors: (*Differential equations, *Numerical solution), Computers.

For abstract, see NSA 28 02, number 04978.

COO-1469-221/GA PC$3.50/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
STABILITY AND CONVERGENCE OF VARIABLE ORDER MULTISTEP METHODS.
C. W. Gear, and D. S. Watanabe. May 73, 30p
UIUCDCS-R-73-571
Contract AT(11-1)-1469

Descriptors: (*Mathematics, *Multi-parameter analysis), Algorithms, Differential equations, Stability.

For abstract, see NSA 28 02, number 04979.

EUR-4959/GA PC$5.25/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
ALGORITHM FOR NONLINEAR DATA FIT BY THE LEAST SQUARES METHOD.
E. van der Voort, and J. P. Halleux. Apr 73, 64p
U.S. Sales Only.

Descriptors: (*Nonlinear problems, *Algorithms), (*Computer codes, *D codes), Iterative methods, Least square fit, Mathematical models, Statistics.

For abstract, see NSA 28 03, number 07632.

JINR-P11-6933/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques and Automation.
METHODS OF INVERSION OF QUASITRIDIAGONAL AND BANDMATRICES.
G. A. Emel'yanenko. 1973, 17p
In Russian. U.S. Sales Only.

Descriptors: Mathematics, Matrices.

For abstract, see NSA 28 02, number 05039.

JINR-P2-6957/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
BUST MATRIX ELEMENTS FOR REDUCTION O(3,1) CONTAINS O(2,1) CONTAINS O(2).
Ya. A. Smorodinskii, and G. I. Shepelev. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: (*O groups, *Matrix elements), Coordinates, Cylinders, Functions.

For abstract, see NSA 28 02, number 05035.

JINR-P2-7002/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
TRACES OF REPRESENTATIONS OF A GROUP OF GENERALIZED SHEARS OF THE FIVE-DIMENSIONAL HYPERBOLOID.
V. M. Lebedenko. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: Algebra, Functions, Group theory, Integrals, Irreducible representations, Lie groups, Mathematical operators, Shear, Unitary symmetry.

For abstract, see NSA 28 02, number 05036.

KAPL-P-3962/GA PC$3.00/MF$1.45
Knolls Atomic Power Lab., Schenectady, N. Y.
ALGEBRAIC-GEOMETRY FOUNDATIONS FOR FINITE-ELEMENT COMPUTATION.
E. L. Wachspress. 1973, 11p
Contract W-31-109-eng-52

Descriptors: Algebra, Finite element method, Geometry, Polynomials.

For abstract, see NSA 28 03, number 07635.

LA-5116/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LINEAR FUNCTIONS, DIFFERING WEIGHTS, AND NONLINEAR LEAST SQUARES.
R. H. Moore. Apr 73, 11p
Contract W-7405-eng-36

Descriptors: (*Least square fit, *Functions), Algorithms, Nonlinear problems.

For abstract, see NSA 28 02, number 04984.

MLM-2058(TR)/GA PC$3.00/MF$1.45
SOME OF THE METHODS OF THE POISSON PROCESS GENERATION.
E. Pleszczynska. 1963, 14p
Translated for Mound Lab., Miamisburg, Ohio, from a report.

Descriptors: Mathematics, Poisson equation, Randomness, Statistics, Stochastic processes.

For abstract, see NSA 28 03, number 07637.

N73-27517/4GA PC$6.25/MF$1.45
Maryland Univ., College Park. Computer Science Center.
TOPOLOGIES ON DIRECTED GRAPHS.
R. N. Lieberman. Dec 72, 82p NASA-CR-133342, TR-214
Contracts NGL-21-002-008, NSF GJ-32258X

Descriptors: *Set theory, *Topology, Graphs (Charts), Mapping.

For abstract, see STAR 1118

N73-27518/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE DEVELOPMENT OF ACCURATE AND EFFICIENT METHODS OF NUMERICAL QUADRATURE.
T. Feagin. Jun 73, 17p NASA-TM-X-66277, X-582-73-176

Descriptors: *Integral calculus, *Numerical integration, *Quadratures, Errors, Formulas (Mathematics), Numerical analysis.

For abstract, see STAR 1118

N73-27519/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN EXTENSION OF THE QZ ALGORITHM FOR SOLVING THE GENERALIZED MATRIX EIGENVALUE PROBLEM.
R. C. Ward. Jul 73, 54p NASA-TN-D-7305, L-8899

Descriptors: *Algorithms, *Eigenvalues, Matrices (Mathematics), Numerical analysis, Problem solving.

For abstract, see STAR 1118

N73-28605/6GA PC$5.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
ON THE OPERATOR THEORY OF N-TH DEGREE MODULAR FORMS.
M. Koecher. Aug 73, 59p NASA-TT-F-15006
Tran-Transl. Into English from Math. Ann. (Leipzig), V. 130, 1956 p 351-368.

Descriptors: *Abel function, *Operators (Mathematics), *Rings (Mathematics), Matrix theory, Transformations (Mathematics).

For abstract, see STAR 1119

N73-28606/4GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DATA COMPRESSION PRESERVING STATISTICAL INDEPENDENCE.
G. E. Morduch, and W. M. Rice. May 73, 33p
NASA-TM-X-70419, X-591-73-143

Descriptors: *Data reduction, *Statistical analysis, Legendre functions, Matrices (Mathematics), Polynomials, Vector analysis.

For abstract, see STAR 1119

N73-28607/2GA PC$3.50/MF$1.45
Connecticut Univ., Storrs.
A REDUCED ADAPTIVE OBSERVER FOR MULTIVARIABLE SYSTEMS.
R. L. Carroll, and D. P. Lindorff. Jun 73, 30p
NASA-CR-133429, TR-73-3
Contract NGL-07-002-002

Descriptors: *Adaptive control, *Linear systems, *Multiple output programs, Algorithms, Liapunov functions.

For abstract, see STAR 1119

N73-28608/0GA PC$9.25/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
THE SOLUTION OF HELMHOLTZ' EQUATION IN EXTERIOR DOMAINS USING INTEGRAL EQUATIONS.
Ph.D. Thesis - London Univ.
A. J. Burton. Jan 73, 141p NPL-NAC-30

Descriptors: *Acoustic scattering, *Domains, *Electromagnetic scattering, *Integral equations, *Wave equations, Boundary value problems, Operators (Mathematics), Problem solving, Sound waves, Wave functions.

For abstract, see STAR 1119

PB-223 325/2GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.

HOW TO USE TWO (2) COMPUTATIONAL STRATEGIES TO SOLVE SIMPLE SYSTEM IDENTIFICATION PROBLEMS.
Forest Service general technical rept.,
Rolfe A. Leary. 1 Sep 72, 19p FSGTR-NC-2

Descriptors: (*Nonlinear differential equations, Numerical integration), Boundary value problems, Matrices(Mathematics), Computation, Partial differential equations, Difference equations.
Identifiers: Two point boundary value problems.

A nonlinear two point boundary-value problem in first-order ordinary difference equations is hand solved using two computational strategies: a modified method of complementary functions and the particular solutions perturbation method. All computations are included. It is anticipated that persons will be better able to use the available digital computer programs after hand solution of this simple problem considered.

PB-223 389/8GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
AN ALGORITHM FOR DETERMINING WHETHER THE CONNECTIVITY OF A GRAPH IS AT LEAST K.
Technical rept.,
Shimon Even. Sep 73, 13p CU-CSD-73-184
Prepared in cooperation with Weizmann Inst. of Science, Rehovot (Israel). Dept. of Computer Science.

Descriptors: (*Graph theory, Algorithms), Network flows, Set theory, Theorems.
Identifiers: Connectivity(Graphics).

The algorithm presented in the paper is for testing whether the connectivity, of a large graph of n vertices, is at least k. First the case of undirected graphs is discussed, and then it is shown that a variation of this algorithm works for directed graphs. The number of steps the algorithm requires, in case k < square root of (n), is bounded by O (k(n cubed)). (Author)

STAN-CS-73-335/GA PC$3.00/MF$1.45
Stanford Univ., Calif. Dept. Of Computer Science.
COMPUTATION OF THE STATIONARY DISTRIBUTION OF AN INFINITE MARKOV MATRIX.
G. Golub, and E. Seneta. Jan 73, 12p SU-326-P-30-24

Descriptors: (*Matrices, *Markov process), Algorithms, Distribution, Stochastic processes.

For abstract, see NSA 28 03, number 07644.

SU-326-P-30-25/GA PC$3.50/MF$1.45
Stanford Univ., Calif. Dept. Of Computer Science.
COMPUTATION OF THE LIMITED INFORMATION MAXIMUM LIKELIHOOD ESTIMATOR.
W. Dent, and G. H. Golub. Feb 73, 28p STAN-CS-73-339

Descriptors: Algorithms, Economics, Equations, Least square fit, Mathematics, Matrices, Statistics.

For abstract, see NSA 28 03, number 07645.

TP-422/GA PC$3.50/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
FORTRAN SUBROUTINES FOR THE SOLUTION OF LAPLACE'S EQUATION OVER A GENERAL REGION IN TWO DIMENSIONS.
J. K. Reid, and A. B. Turner. Sep 70, 30p
U.S. Sales Only.

Descriptors: (*Laplace equation, *Numerical solution), Algorithms, Finite element method, Fortran, Matrices, Two-dimensional calculations.

For abstract, see NSA 28 02, number 04990.

TP-483/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
UNCONSTRAINED MINIMIZATION ALGORITHMS WITHOUT COMPUTATION OF DERIVATIVES.
M. J. D. Powell. Apr 72, 12p
U.S. Sales Only.

Descriptors: (*Algorithms, *Differential equations), Functions.

For abstract, see NSA 28 03, number 07646.

12B. Operations Research

AD-767 032/6GA PC$3.00/MF$1.45
California Univ Berkeley Operations Research Center
BOUNDS AND INEQUALITIES ON THE RATE OF POPULATION GROWTH.
Research rept.,
Richard E. Barlow, and Joao L. M. Saboia. Aug 73, 50p Rept no. ORC-73-14
Contract N00014-69-A-0200-1036, Grant NSF-GP-33697

Descriptors: (*Biometry, Stochastic processes), (*Population, Biometry), Females, Birth, Mortality rates, Survival, Random variables, Mathematical models, Theorems.
Identifiers: Birth and death processes, Growth models, Biometrics.

The paper uses reliability theory concepts and techniques to bound the Malthusian parameter (or rate of population growth), the reproductive value of a population, and related population parameters. These results are potentially useful for population control when age specific birth and death rates are not known exactly or may be in error. (Author)

AD-767 067/2GA PC$2.75/MF$1.45
Case Western Reserve Univ Cleveland Ohio Dept of Operations Research
COMPUTATIONAL EXPERIENCE WITH AN ENUMERATIVE ALGORITHM FOR THE SET COVERING PROBLEM WITH BASE CONSTRAINTS.
Technical memo.,
Harvey M. Salkin, and Chien H. Lin. Jul 73, 19p
Rept no. TM-313
Contract N00014-67-A-0404-0010
Presented at the National ORSA Meeting (43rd), Milwaukee, Wisc., May 73.

Descriptors: (*Linear programming, Algorithms), Scheduling, Set theory, Simplex method, Optimization.
Identifiers: Integer programming, Constraints, Duality theory, *Set covering problems, Heuristic methods.

An algorithm for the classical set-covering problem with additional base constraints is presented. The base constrained set covering problem is: Minimize cx, subject to Ex > or = B, (x sub j) = 0 or 1 (j = 1,...,n), and Bx < or = d. Here E is an m by n matrix of zeros and ones, e is an m column of ones, c and d are nonnegative vectors, and B is a nonnegative array having row diagonal structure. The algorithm is basically a zero-one single branch enumeration with linear programming and other feasibility criteria. A heuristic is used which sometimes finds an initial solution to the base constrained set-covering problem. Computational results are given. (Author)

AD-767 084/7GA Reprint
Hawaii Univ Honolulu Dept of Physics and Astronomy
A WELL-BALANCED ADAPTIVE LINEAR DECISION FUNCTION,
Satosi Watanabe, and Tsuguchika Kaminuma.
1968, 5p AFOSR-TR-73-1615
Grant AF-AFOSR-1466-68
Availability: Pub. in Proceedings of the National Electronics Conference, Chicago, Ill. v24 p20-22, 9-11 Dec 68.

Descriptors: (*Decision theory, Functions), Algorithms, Artificial intelligence, Adaptive systems.

When the number of paradigms (class-samples) is relatively small leaving a large unoccupied space between two groups of points, the usual adaptive linear decision function can converge to a hyperplane at a highly unbalanced position in this open domain. The proposed algorithm, while remaining adaptive and convergent, places the hyperplane at a reasonably well-balanced position each time the adaptive correction is made. (Author)

AD-767 095/3GA PC$4.75/MF$1.45
Stanford Univ Calif Dept of Operations Research
INTERNATIONAL SYMPOSIUM ON MATHEMATICAL PROGRAMMING (8TH) HELD AT STANFORD, CALIF., 27-31 AUG 73. ABSTRACTS.
Final rept.,
Richard W. Cottle. 21 Sep 73, 153p*
Contract N00014-73-C-0314

Descriptors: (*Mathematical programming, Symposia), Stochastic processes, Game theory, Programming(Computers), Linear programming, Nonlinear programming, Quadratic programming, Dynamic programming, Convex sets, Curve fitting, Least squares method, Optimization.
Identifiers: Control theory, Integer programming, Branch and bound method.

The report contains abstracts of various papers presented on optimization techniques, game theory, and mathematical programming.

AD-767 124/1GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON THE EXISTENCE OF OPTIMAL SOLUTIONS TO INTEGER AND MIXED-INTEGER PROGRAMMING PROBLEMS.
Technical summary rept.,
R. R. Meyer. Aug 73, 21p Rept no. MRC-TSR-1351
Contract DA-31-124-ARO-D-462

Descriptors: (*Linear programming, Optimization), Matrix algebra, Inequalities, Convex sets, Theorems.
Identifiers: *Integer programming, Mixed integer programming, Existence theorems.

The purpose of the paper is to present sufficient conditions for the existence of optimal solutions to integer and mixed-integer programming problems in the absence of upper bounds on the integer variables. It is shown that (in addition to feasibility and boundedness of the objective function) in the pure integer case a sufficient condition is that all of the constraints (other than non-negativity and integrality of the variables) be equalities, and that in the mixed-integer case rationality of the constraint coefficients is sufficient. Some computational implications of these results are also given. (Author)

AD-767 128/2GA PC$2.75/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
'ENVELOPE PROGRAMMING' AND CONJUGATE DUALITY.
Technical summary rept.,
L. McLinden. Jul 73, 20p Rept no. MRC-TSR-1348
Contract DA-31-124-ARO(D)-462

Descriptors: (*Mathematical programming, Convex sets), Minimax technique, Saddle point

method, Vector spaces, Topology, Graphics, Banach space, Theorems.
Identifiers: Duality theory, Envelope programming.

In a recent paper D. J. White presented a new approach to the problem of minimizing a differentiable convex function over a convex set. The idea begins with describing the convex function as the envelope of its tangent hyperplanes. With this description the given problem is represented in 'min max' form. An appeal to White's minimax theorem then permits one to interchange the extrema and arrive at a dual problem having 'max min' form. In the present paper White's approach is first generalized and analyzed and then related to well-known results in conjugate duality. (Author)

AD-767 171/2GA Reprint
California Univ Berkeley Coll of Engineering
A NEW ALGORITHM FOR FINDING ALL SHORTEST PATHS IN A GRAPH OF POSITIVE ARCS IN AVERAGE TIME O(N SQUARED LOG SQUARED N),
P. M. Spira. 5 Sep 72, 6p AFOSR-TR-73-1619
Contract F44620-71-C-0087, Grant DA-ARO-D-31-124-71-G174
Availability: Pub. in SIAM Jnl. Computing, v2 n1 p28-32 Mar 73.

Descriptors: (*Graphics, Algorithms), Binary arithmetic, Random variables, Theorems.
Identifiers: Graph theory, Trees(Mathematics), Shortest path method, Directed graphs, Network flows.

The author presents a new algorithm for finding the shortest path between each pair of nodes in a directed nonnegatively weighted graph. The algorithm has average running time O(n squared log squared n) where the graph has n nodes in contrast to previous algorithms in the literature, all of whose average running times are o(n cubed) for this problem. (Author)

AD-767 372/6GA PC$2.75/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
STATISTICAL ANALYSIS OF MULTISERVER QUEUEING SIMULATIONS.
Technical rept.,
George S. Fishman. Sep 73, 21p Rept no. TR-28-1
Contract N00014-67-A-0097-0028

Descriptors: (*Queueing theory, Statistical analysis), Probability, Distribution functions, Mathematical models, Transformations(Mathematics), Simulation.
Identifiers: Maximum likelihood estimation, GI/G/m queue, Service time.

The paper presents methods for computing point and interval estimates of descriptors of simulated queueing systems. The methods, which rely on the renewal process representation of certain queueing models, extend the results of previous papers. In particular, two suggested procedures combine sample state times and job completion counts data to produce estimates with desirable statistical properties. One procedure uses linear combinations of the data to derive minimum length interval estimates. The other derives the maximum likelihood estimates of three system descriptors, transformations of which can be used to give maximum likelihood estimates of a variety of other system descriptors. The paper also describes how to extend the results here to other queueing systems and illustrates the approach on a queueing system with finite waiting room. (Author)

AD-767 373/4GA PC$3.00/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
ALTERNATIVE DATA ANALYSIS TECHNIQUES FOR QUEUEING SIMULATIONS.
Technical rept.,
George S. Fishman. Sep 73, 27p Rept no. TR-28-2
Contract N00014-67-A-0097-0028

Descriptors: (*Queueing theory, Statistical analysis), Simulation, Confidence limits, Probability.
Identifiers: Statistical inference, Degrees of freedom, Service times.

The paper describes three alternative methods for performing a statistical analysis on the output of queueing simulations. One method makes use of the renewal property of certain queueing systems. The second makes use of the periodic sampling of the processes of interest in the simulation and the third relies on the job completion times to indicate when the processes should be sampled. The paper describes each methods's benefits and disadvantages. In particular it is shown that a priori information regarding interarrival and service times can be incorporated into all three method to reduce significantly the amount of data needed to estimate a substantial number of system descriptors. (Author)

AD-767 382/5GA PC$2.75/MF$1.45
Texas Univ Austin Center for Numerical Analysis
SPLINES AND EFFICIENCY IN DYNAMIC PROGRAMMING,
James W. Daniel. Sep 73, 9p Rept no. CNA-78
Contract N00014-67-A-0126-0015

Descriptors: (*Dynamic programming, Efficiency), Approximation(Mathematics), Interpolation, Polynomials.
Identifiers: Spline functions, *Spline approximation, *Spline interpolation, Orthogonal functions.

It is shown how one can use splines, represented in the B-spline basis, to reduce the difficulties of large storage requirements in dynamic programming via approximations to the minimum-return function without the inefficiency associated with using polynomials to the same end. (Author)

AD-767 459/1GA Reprint
Maryland Univ College Park Dept of Electrical Engineering
A HEURISTIC STRATEGY FOR MULTIMODAL SEARCH,
Jasna Opacic. 15 Aug 72, 17p AFOSR-TR-73-1800
Grant AF-AFOSR-1910-70
Prepared in cooperation with Bell Labs., Whippany, N.J.
Availability: Pub. in International Jnl. of Systems Science, v4 n3 p485-500 1973.

Descriptors: (*Search theory, Optimization), Functions, Mathematical logic, Algorithms.
Identifiers: Heuristic methods, Trees(Mathematics), Automata theory.

A heuristic search is described which has the aim of finding practically all extrema of a given nonlinear functional. A standard unimodal descent algorithm is employed for finding individual extrema. This basic algorithm is applied repeatedly using various computed initial points and starting directions. Through an additional use of several learning cycles most available extrema can be found. Numerical experiments indicate that the method is certainly very efficient for functionals of dimensions 15-20 with 20-25 extrema. (Author)

AD-767 469/0GA PC$7.25/MF$1.45
North Carolina Univ Chapel Hill Dept of Statistics
SOME RELATED QUEUEING MODELS WITH DEPENDENT SERVICE AND INTER-ARRIVAL TIMES.
Doctoral thesis,
Colin E. Jeffcoat. Jun 73, 101p Rept no. Mimeo Ser-876
Contract N00014-67-A-0321-0002

Descriptors: (*Queueing theory, Stochastic processes), Mathematical models, Distribution functions, Random variables, Integral transforms, Matrix algebra, Theorems, Theses.
Identifiers: Service times, Single server queue, Markov chains, Laplace transformation.

Some related queueing models which allow for a type of dependence between service and inter-arrival times are discussed. Particular cases of the general models are the transition models, for which arrivals are generated by transitions in a Markov chain in continuous time. Possible applications for these models are production lines, doctor's appointments and storage situations. The stationary behavior of the forward and backward models is analyzed. The case of the forward model has been examined before, and quite general results are possible. The author considers how these results relate to the forward transition model. A complete analysis of the stationary behavior for backward models is achieved only in particular case of expotential arrivals, it is shown how to compute the Laplace transform of the stationary distribution of total waiting times. The authors also analyze the busy period distribution for the last model, and show how to compute the busy period transform. (Modified author abstract)

AD-767 485/6GA Reprint
Illinois Univ Urbana Coordinated Science Lab
SAMPLED-DATA NASH CONTROLS IN NON-ZERO-SUM DIFFERENTIAL GAMES,
M. Simaan, and J. B. Cruz, Jr. 20 Jun 72, 10p
AFOSR-TR-73-1707
Contract DAAB07-72-C-0259, Grant AF-AFOSR-1579-68
Sponsored in part by Grant NSF-GK-36276.
Availability: Pub. in International Jnl. of Control, v17 n6 p1201-1209 1973.

Descriptors: (*Game theory, Control systems), Differential equations, Matrix algebra, Evasion.
Identifiers: Non zero sum differential games, Differential games, Pursuit evasion games, Nash solutions, Control theory.

Non-zero-sum differential games where measurements of the state vector are possible only at discrete instants of time during the course of play are considered, and necessary conditions for the existence of a pair or sampled-data Nash controls are obtained. These conditions are different from those corresponding to the open-loop or closed-loop solutions. Linear quadratic games are then treated and a simple illustrative example which reduces to a pursuit-evasion game is presented. (Author)

AD-767 650/5GA PC$3.00/MF$1.45
California Univ Los Angeles Western Management Science Inst
DYNAMIC PROGRAMMING, QUEUEING OPTIMIZATION, AND THEIR APPLICATIONS.
Interim progress rept. 1 May 72-30 Apr 73,
Steven A. Lippman. 30 Apr 73, 7p AFOSR-TR-73-1671
Grant AF-AFOSR-2349-72

Descriptors: (*Queueing theory, Optimization), (*Dynamic programming, Optimization), Stochastic processes, Scientific research, Inventory control.
Identifiers: SemiMarkov decision processes.

The areas of research include the theoretical development of semi-Markov decision processes (SMDP). In particular, an optimal stationary policy, determined by the usual functional equation, was found in both the discounted and average cost case, when the system described by the SMDP is a queueing reward system with infinite queue capacity. A dynamic queueing optimization problem has been solved in which the decision-maker controls the arrival process by increasing or decreasing the price charged for a facility's service. A new technique in the optimization of exponential queueing systems was developed. An

Air Force transportation inventory model concerning the logistics of spare items was developed using a dynamic programming decision rule. Research was also completed in the areas of optimal consumption with a stochastic income stream and optimal reinsurance. (Modified author abstract)

AD-767 658/8GA PC$4.25/MF$1.45
Naval Postgraduate School Monterey Calif
A BRANCH AND BOUND ALGORITHM FOR THE DELIVERY TRUCK PROBLEM.
Master's thesis,
Stephen John Balut. Jun 73, 44p

Descriptors: (*Scheduling, Algorithms), Transportation, Fuel consumption, Mathematical models, Optimization, Theses, Computer programs.
Identifiers: Branch and bound method, Routing, Delivery, Delivery problem, Transportation models.

The delivery truck problem is one in which a truck is loaded with m packages, one package to be delivered to each of m destinations. The amount of fuel consumed by the truck is directly dependent upon the current total weight of the truck, which includes both the weight of the packages and the amount of fuel remaining in the tank. The problem is to determine a sequence in which to deliver all m packages which will minimize total fuel consumption. A branch and bound algorithm for obtaining optimal solutions to the delivery truck problem is presented, along with several sample problems with their solutions. A brief report of computational experience is included. (Author)

AERE-R-6354/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
CALCULATION OF FEASIBLE POINTS FOR LINEARLY CONSTRAINED OPTIMIZATION PROBLEMS.
R. Fletcher. Apr 70, 20p
U.S. Sales Only.

Descriptors: (*Mathematics, *Boundary conditions), Algorithms, Fortran.

For abstract, see NSA 28 02, number 04974.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

N73-28449/9GA PC$13.50/MF$1.45
RESEARCH STUDY ON ANTISKID BRAKING SYSTEMS FOR THE SPACE SHUTTLE.
J. A. Auselmi, L. W. Weinberg, R. F. Yurczyk, and W. G. Nelson. 1973, 226p NASA-CR-124349, D6-41115
Contract NAS8-27864

Descriptors: *Aircraft equipment, *Antiskid devices, *Brakes (For arresting motion), *Space shuttles, *Systems analysis, Equipment specifications, Performance prediction, Spacecraft components.

For abstract, see STAR 1119

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-767 034/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DUCT FOR REMOVAL OF SMOKE AND GASES OF INDUSTRIAL BUILDINGS AND CONSTRUCTION,
N. P. Kurchavov, S. B. Proskuryakov, S. B. Terekhov, A. V. Khramushin, and I. A. Shishkov. 19 Sep 73, 5p Rept no. FTD-HT-23-165-74
Edited trans. of Patent (USSR) 337 484 p1-2, 5 May 72, by Kathleen L. Dion.

Descriptors: (*Ventilation ducts, Corrosion inhibition), Buildings, Porous materials, Gas flow, Boundary layer, Patents, USSR.
Identifiers: Translations, Liners.

The patent describes a duct for smoke and gases of industrial buildings which includes a shaft and lining separated by an annular gap from mutually insulated sections and air passages. For corrosion protection the lining is made of porous material through which air passes to form a protective zone of the inner surface.

COM-73-50799/8GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.
SEVEN WAYS TO REDUCE FUEL CONSUMPTION IN HOUSEHOLD HEATING THROUGH ENERGY CONSERVATION.
Virginia Knauer, and Lawrence M. Kushner. Dec 72, 12p
Prepared in cooperation with the Ad Hoc Committee on Fuel Conservation, Washington, D.C.
Paper copy available from GPO $0.35 as stock no. 0303-01086.

Descriptors: (*Houses, *Heating), Residential buildings, Heat loss, Fuel consumption, Reduction.

Increasing demand for natural gas, No. 2 heating oil, low sulfur residual fuel oil, low sulfur bituminous coal, and electricity in the United States is imposing great pressures on available supplies. Conservation in the use of fuel and energy can reduce these pressures on demand, and at the same time provide the additional benefit of a reduction in environmental pollution. The brochure describes practical ways by which one can conserve. Important examples are: reset thermostat to lowest acceptable setting, such as two or three degrees below usual setting; service oil burners regularly (including replacement of filters) and turn off heat supply in unused rooms; keep draperies, shades and shutters closed except when needed for light; reduce the consumption of electricity during late afternoon and early evening periods; and improve insulation in attics and around doors and windows.

GAT-Z-4128(Vol.2)/GA PC$5.45/MF$1.45
New York Univ., N.Y. (Usa). Dept. Of Aeronautics and Astronautics.
EXPERIMENTAL INVESTIGATION OF AIR RECIRCULATION CHARACTERISTICS OF AIR COOLED CONDENSER ARRAYS ON A PROCESS BUILDING. REPORT EERL-TR--105.
W. G. Hoydysh, G. H. Strom, and R. R. Cirillo. Jul 71, 143p
Contract AT(33-2)-1

Descriptors: (*Heat exchangers, *Gas flow), Air, Buildings, Data, Performance, Vapor condensation, Velocity, Ventilation.

For abstract, see NSA 28 03, number 05454.

N73-27451/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CASTING COPPER TO TUNGSTEN FOR HIGH POWER ARC LAMP CATHODES.
H. A. Will. Aug 73, 11p NASA-TM-X-2865, E-7456

Descriptors: *Arc lamps, *Cathodes, *Copper alloys, *Refractory metal alloys, *Tungsten alloys, Equipment specifications, Manufacturing, Product development, Service life.

For abstract, see STAR 1118

N73-27800/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STARTUP ANALYSIS FOR A HIGH TEMPERATURE GAS LOADED HEAT PIPE.
P. M. Sockol. Jul 73, 21p NASA-TM-X-2840, E-7416

Descriptors: *Energy transfer, *Heat pipes, *Thermal conductivity, *Thermal energy, Argon, Equipment specifications, Lithium, Systems analysis, Thermodynamic properties.

For abstract, see STAR 1118

N73-28917/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
VARIABLE CONDUCTANCE HEAT PIPES FROM THE LABORATORY TO SPACE.
J. P. Kirkpatrick. Jul 73, 16p NASA-TM-X-62290

Descriptors: *Conductive heat transfer, *Heat pipes, Heat sinks, Heat sources, Temperature control, Thermal stability.

For abstract, see STAR 1119

N73-28920/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DESIGN AND TESTING OF A PASSIVE, FEEDBACK-CONTROLLED, VARIABLE CONDUCTANCE HEAT PIPE.
K. R. Schlitt. Aug 73, 16p NASA-TM-X-62293
Subm-Sponsored in Part by NAS-Nrc.

Descriptors: *Feedback control, *Gases, *Heat pipes, Liquids, Pentanes, Resistance, Systems engineering.

For abstract, see STAR 1119

PATENT-3 677 337/GA Not available NTIS
Department of the Air Force Washington D C
HEAT TRANSFER APPARATUS WITH OSMOTIC PUMPING.
Patent,
Lawrence L. Midolo. Filed 10 Sep 70, patented 18 Jul 72, 5p Rept nos. PAT-APPL-70 977,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Heat exchangers, *Patents), Heat sinks, Osmotic pressure, Membranes, Pumps, Evaporation, Steam condensers, Aircraft.
Identifiers: PAT-CL-165-105, Salt water.

The patent describes an apparatus for transferring thermal energy from a heat source to a heat sink having a closed space containing a saline solution and an evaporator wherein the heat input evaporates the liquid so that a water vapor moves toward a condenser where heat is rejected to return the water vapor to the liquid phase. The closed space containing the saline solution extends to the region of the condenser and has a water permeable membrane positioned adjacent to the condenser. The water is returned to the evaporator by osmotic pumping.

PATENT-3 701 498/GA Not available NTIS
Office of the Secretary of the Army Washington D C
FIBEROPTIC CLEARANCE LIGHT SYSTEM.
Patent,
Peter B. Ferrara. Filed 3 Jun 71, patented 31 Oct 72, 4p Rept nos. PAT-APPL-149 420,

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Fiber optics, *Patents), (*Helicopters, *Lighting equipment), Illumination, Identification lights, Aviation safety, Rotor blades(Rotary wings).
Identifiers: PAT-CL-244-17-11.

The patent relates to a device whereby problems with individual lamps on helicopter blades are minimized by use of a single source of white light and fiberoptic cables to pipe the light together with colored lenses (e.g. red for port and green for starboard).

PATENT-3 725 566/GA Not available NTIS
Department of the Navy Washington D C
EVAPORATIVE COOLING AND HEAT EXTRACTION SYSTEM.
Patent,
Bruno T. Plizak. Filed 1 May 72, patented 3 Apr 73, 5p Rept nos. PAT-APPL-247 398,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Heat exchangers, *Patents), (*Electronic equipment, Heat exchangers), Heat transfer, Coolants, Porous materials, Membranes, Gas flow, Enthalpy, Thermodynamics.
Identifiers: Avionics, PAT-CL-174-15-R.

The patent describes a heat transfer system. Heat transfer is accomplished from electronic components by inserting simultaneously both a liquid coolant and a gas into a chamber having a high heat flux surface forming one side of the chamber. A porous membrane section forms on opposite side of the chamber and permits both the gas and a hot vapor formed from the water to escape. In operation the gaseous flow is used to break up the liquid coolant film that forms on the high heat flux surface.

PB-222 999/5GA PC$3.75/MF$1.45
Naval Weapons Center, China Lake, Calif.
HIGHWAY EMERGENCY LIGHT CHEMILUMINESCENT FLARES.
Final rept. Mar 72-Jun 73,
S. M. Little, C. H. Morley, and D. W. Harris. Jul 73, 95p* NWC-TN-353-14, NWC-TN-353-15 DOT-HS-800 892
Contract DOT-HS-194-2-3071A
Also pub. as NWC-TN-353-16, and NWC-TN-353-17.

Descriptors: (*Flares, Evaluation), (*Chemiluminescence, Flares), (*Highway lighting, Safety devices), Fluorescence, Fluorescent lamps, Luminaires, Emission, Chemical composition, Fabrication, Cost analysis, Accident prevention.
Identifiers: Chemical lights.

The report consists of a series of technical notes describing the development, production and evaluation for highway traffic use of a non-thermal, fluorescent light source. The chemical light EX17MODO, bright orange in color was used as the basis for a feasibility demonstration. Two thousand such lights with holders were fabricated and delivered to the NHTSA. The report contains operating instructions, preliminary fabrication data, a cost analysis which shows that fabrication costs can be less than 0.5 dollars in production quantities, also, the behavior of Chemlite when subjected to environmental conditions is described. Minor tests performed at the Naval Weapons Center for demonstrating the use of Chemlites as emergency highway lights are reported. (Author)

PB-223 536/4GA PC$3.00/MF$1.45
Maryland Univ., College Park. Dept. of Mechanical Engineering.
PROCEEDINGS OF THE SOLAR HEATING AND COOLING FOR BUILDINGS WORKSHOP, HELD IN WASHINGTON, D.C. ON MARCH 21-23, 1973. PART I. TECHNICAL SESSIONS, MARCH 21 AND 22,
Redfield Allen. Jul 73, 231p* NSF-RA/N-73-004
Contract NSF-GI-32488

Descriptors: (*Solar heating, Meetings), (*Cooling, Solar radiation), Solar energy concentrators, Energy storage, Water heaters, Air conditioning, Cooling systems, Heating, Buildings, Proceeding.
Identifiers: Solar collectors.

The Proceedings contain thirty-six technical papers on solar energy for U.S. building applications areas; namely, solar collectors, energy storage, domestic hot water heating, energy conservation and insolation, solar air-conditioning, and systems for solar heating and cooling. Some foreign activities are also reviewed. Each technical paper is a report on: Proposed research, on-going research, proposed systems, or operating systems. Questions and answers from the discussion periods are included, as is an agenda and list of attendees.

13B. Civil Engineering

AD-767 228/0GA PC$7.75/MF$1.45
Scs Engineers Long Beach Calif
AIR FORCE BASE SOLID WASTE MANAGEMENT STUDY.
Technical rept.
Aug 73, 362p AFWL-TR-73-4
Contract F29601-72-C-0151

Descriptors: (*Sanitary engineering, *Military Facilities), Costs, Reclamation.
Identifiers: Offut Air Force Base, Sanitary landfills, Collecting methods, Materials recovery, *Solid waste disposal.

The report describes the evaluation procedures used and findings of a comprehensive investigation of solid waste management practices at Offutt Air Force Base. Included in the study was a one-month survey conducted at Offutt Air Force Base to determine: Descriptive information on current waste management methods. Quantification of solid wastes with respect to weight, volume, and source. A classification of solid waste components (paper, metal, wood, glass, etc.). A characterization of the solid wastes with respect to combustibility, moisture content, and Btu value. Operational costs of solid waste management at the base. Based on field survey findings and a thorough review of alternative available methods, a recommended solid waste management system is presented (Author)

AD-767 229/8GA PC$3.00/MF$1.45
New Mexico Univ Albuquerque Eric H Wang Civil Engineering Research Facility
TREATMENT OF ELECTROPLATING WASTES BY ION EXCHANGE.
Technical rept. 20 Oct 71-1 Oct 72,
Richard B. Lehmann. Aug 73, 41p* AFWL-TR-73-124
Contract F29601-72-C-0024

Descriptors: (*Wastes(Industrial), Electroplating), (*Sanitary engineering, *Electroplating), (*Ion exchange, Wastes(Industrial)), Tests, Performance(Engineering), Cyanides, Regeneration, Water pollution, Metals, Cadmium, Copper, Nickel, Zinc.
Identifiers: Industrial wastes, *Industrial waste treatment, Metal finishing, Water pollution control.

The chemistry, efficiency, and regeneration characteristics of strong anion resins (Dowex MSA-1, Amberlite IRA-938, Duolite A-102D) and mixed bed systems (Dowex MSA-1 and MSC-1, Amberlite IRA-938 and IR-120 plus, Duolite A-102D and C-20) were tested in an attempt to find a satisfactory ion exchange system for the removal of cyanide and heavy metals (Ni, Cu, Cd, Zn) from dilute electroplating wastes. Determination of the species which cause fouling on these resins was also attempted. Results show that the strong anion resins remove both the cyanide and the metal as an anionic complex species. While the removal produces acceptable effluent for disposal into public sewage systems, the capacity of the resin decreases with successive regenerations. In some resin systems this decrease in capacity was as high as 56 percent. In addition, the regeneration liquids contain anionic complex metal cyanides which are unsuitable for recycling and require further treatment. (Author)

AD-767 235/5GA PC$3.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
HULAH DAM EMERGENCY BULKHEAD PROTOTYPE CLOSURE TESTS.
Final rept.,
William C. Blanton, James E. Hall, and David F. Bastian. Sep 73, 26p Rept no. AEWES-Misc-Paper-H-73-8

Descriptors: (*Dams, Control systems), Bulkheads, Test methods, Oklahoma.
Identifiers: Hulah Dam, Caney River.

Prototype tests of the emergency bulkhead gate at Hulah Dam were conducted to determine its effectiveness in stopping flow for various control gate positions. The bulkhead consistently stopped at a position approximately 2 ft above the seat for every opening of the control gate. Measurements of downpull and acceleration revealed that an average peak hoist force of 22,500 lb occurred with the control gate full open and a bulkhead position of 5.8 to 7.0 ft above the seat. A maximum acceleration of 185 in./sec squared (0.5g) was recorded with the control gate full open and the bulkhead 6 ft above the seat. (Author)

AD-767 480/7GA PC$7.25/MF$1.45
Army Engineer Waterways Experiment Station Livermore Calif Explosive Excavation Research Lab
PROJECT TRINIDAD-EXPLOSIVE EXCAVATION TESTS IN SANDSTONE AND SHALE.
Final technical rept.,
Bruce B. Redpath. Jul 72, 105p Rept no. EERL-TR-E-73-1-Rev
Supersedes AD-762 174.

Descriptors: (*Underground explosions, *Cratering), Rock(Geology), Shale, Sandstone, Blast, Airburst, Seismic waves, Explosive materials, Aluminized explosives, Colorado.
Identifiers: Trinidad project, *Excavation, Rock properties, Trinidad(Colorado).

A series of single-, row-, and multiple-charge cratering detonations, with individual charge weights of one to two tons, were carried out in weak, interbedded sandstones and shales near Trinidad, Colorado, in 1970 and 1971. The principal objectives of these excavation experiments; to determine the effects of millisecond delays in row-charge cratering; to experiment with cratering in varying terrain; and to compare the cratering effectiveness of several explosives. Three varieties of aluminized ammonium-nitrate blasting agents and ANFO were used. Airblast and seismic effects of each detonation were monitored. The series culminated with the excavation of a 400-foot long railway cut with 44 tons of explosives distributed among 32 charges. (Author)

AD-767 529/1GA PC$2.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
A DATA-BASED METHODOLOGY FOR SPECIFYING CONSTRUCTION PROJECT DURATIONS.
Technical rept.,

D. W. Halpin, and C. E. DeLong. Aug 73, 24p* Rept no. CERL-TR-P-14

Descriptors: (*Construction, *Scheduling), (*Military facilities, Construction), Contracts, Manpower studies, Time studies, Construction materials, Labor unions, Armed forces procurement, Lead time, Advanced planning, Mathematical models, Data processing systems, Management planning.
Identifiers: *Contract administration, *Contract terms, Negotiations, Cost overruns.

The report presents a method of determining the construction contract performance times for military construction projects. This method is based on information that is regularly reported as feedback during the execution of a construction contract for military construction, Army projects. By organizing the data from the manpower-utilization feedback reports, a model is formulated and mathematically derived. An example of data reduction is presented, and the results of applying the methodology to these projects are reported. A proposal of implementation of the methodology in U.S. Army Corps of Engineers' district offices is presented. (Author)

AD-767 543/2GA PC$3.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
BEHAVIOR OF LINED OPENINGS IN JOINTED AND UNJOINTED MODEL ROCK MASSES.
Final rept.,
James G. Wallace. Sep 73, 59p Rept no. AEWES-TR-N-73-6

Descriptors: (*Underground structures, Loading(Mechanics)), Model tests, Rock(Geology), Pressure, Steel, Cylindrical bodies, Structural geology.
Identifiers: *Tunnel linings, Rock mechanics, Tunnels, Subsurface structures.

The objective of this investigation was to study experimentally the behavior of horizontally oriented, steel-lined cylindrical openings in jointed and unjointed model rock masses subjected to static surface overpressures. The results of six model tests are presented and discussed herein. Three of the tests were conducted on virgin jointed model rock masses containing steel-lined cylindrical openings. The other three tests were repeated loadings of an unjointed model rock mass containing a steel-lined opening. The boundary conditions were approximately plane stress conditions in all cases. The development of jointed model rock masses and the required instrumentation are also described herein. The behavior of the steel liners was measured with circumferential strain gages and diametric extensometers. The free-field response was measured with SE-type stress gages. Test results indicated that even widely spaced joints drastically influence the moments and diametrical movements of the tunnel liner, but that the thrust is not so grossly affected. (Author)

AD-767 637/2GA PC$2.75/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
SNOW ROAD CONSTRUCTION TECHNIQUE BY LAYERED COMPACTION OF SNOW-BLOWER PROCESSED SNOW.
Technical note, Sep 72-Jan 73,
M. W. Thomas, and K. D. Vaudrey. Aug 73, 17p Rept no. NCEL-TN-1305

Descriptors: (*Snow, Compacting), (*Roads, Snow), Snow vehicles, Trafficability, Blowers, Tractors, Towed vehicles, Antarctic Regions.
Identifiers: Cold weather construction.

Elevated high-strength snow roads are constructed over the deep snowfields in Antarctica between McMurdo Station and the Williams Field complex to move cargo and personnel in rubber-tired vehicles. The purpose of this experiment was to simplify the existing techniques developed by the Naval Civil Engineering Laboratory (NCEL) for constructing these snow roads. To achieve this objective, new cutter-heads were installed on the ski-mounted snowblower, the pulverized snow was deposited and spread in 4-inch layers which were compacted by walking the area with LGP D-8 tractors. This modified procedure is described as it was performed in the field, followed by a recommended outline for future snow road construction. This new method eliminates the special ski-mounted snow mixers, a savings of both costly equipment and construction time. Tests results show that the experimental snow road densities and shear strengths compare favorably with those of previous roads, built by pulvimixing. The experimental test section held up under two months of wheeled traffic, proving that snow roads built by the new construction technique will give satisfactory service. (Author)

AERE-R-6231/GA PC$5.45/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
AMMONIA AND RELATED ATMOSPHERIC POLLUTANTS AT HARWELL. PART I. TECHNIQUES FOR HOURLY SAMPLING AND ANALYSIS OF POLLUTANTS. PART II. CORRELATION OF RESULTS OF HOURLY SAMPLING.
T. V. Healy, H. A. C. McKay, and A. Pilbeam. Oct 72, 57p
U.S. Sales Only.

Descriptors: (*Aere, Air pollution), (*Air samplers, *Design), (*Air pollution, *Sampling), Aerosols, Ammonia, Ammonium compounds, Earth atmosphere, Monitoring, Particles, Performance testing, Residues, Smokes, Sulfur oxides.

For abstract, see NSA 28 03, number 05601.

ANL/ES-24/GA PC$5.45/MF$1.45
Argonne National Lab., Ill.
EFFECTIVENESS OF A HYPOTHETICAL AIR-POLLUTION EPISODE-CONTROL STRATEGY FOR TWO CHICAGO EPISODES.
T. P. Wangler, and A. D. Rossin. Jan 73, 64p
Contract W-31-109-Eng-38

Descriptors: (*Air pollution, *Mathematical models), Aerosols, Buildings, Daily variations, Diffusion, Emission, Health hazards, Human populations, Illinois, Industrial plants, Meteorology, Power plants, Residues, Seasonal variations, Smokes, Sulfur oxides.

For abstract, see NSA 28 03, number 07654.

COM-73-11453/0GA PC$3.50/MF$1.45
National Bureau of Standards, Washington, D.C.
THE SHIRLEY HIGHWAY EXPRESS-BUS-ON-FREEWAY DEMONSTRATION PROJECT - USERS' REACTIONS TO INNOVATIVE BUS FEATURES.
Interim rept. no. 3,
Theodore H. Saks, Richard F. Yates, and Keith M. Goodman. Jun 73, 54p* NBSIR-73-265
Contract DOT-AT-10005

Descriptors: (*Mass transportation, *District of Columbia), (*Bus lines, Freeways), (*Attitudes, Surveys), Projects, Buses(Vehicles), Urban transportation.

The elements tested in the demonstration project include: An exclusive bus lane in the median of a freeway and bus priority lanes in the downtown distribution area; fringe parking facilities which are coordinated with the bus service; new-look/new-feature buses; and extension of service to additional residential areas in an overall systems approach to the improvement of mass transit. As part of the evaluation of the demonstration project, a survey of commuters on board these buses was undertaken in order to obtain users attitudes concerning the special interior bus features as well as transit service features. The results obtained from this study should be of interest to persons considering how to allocate expenditures for new bus vehicles and transit service improvements. Bus commuters perceptions of the relative importance of various bus interior features (i.e., carpeting, special lighting, etc.) and transit service features (i.e., reliable schedules, assurance of a seat, etc.) are analyzed in the report, along with their relative satisfaction assessments of the special bus interior features. Analyses were conducted to determine if marginal improvements in interior comfort and aesthetic features proved significantly more appealing to bus commuters. The relative impact of various project marketing and promotional techniques is also presented.

COM-73-11490/2GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
AUTOMOBILE AIR POLLUTION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1970-May 73,
Edward J. Lehmann. Jul 73, 146p* NTIS-WIN-73-034
Supersedes NTIS-PK-117.

Descriptors: (*Air pollution, *Automobiles), (*Bibliographies, Air pollution), Urban transportation, Transportation management, Automotive fuels, Fuel additives, Exhaust gases, Automobile engines.
Identifiers: *Automobile exhaust, Hybrid vehicular propulsion.

The NTISearch bibliography contains 134 selected abstracts of research reports covering the period 1970 to May 1973 retrieved using the NTIS on-line search system--NTISearch. The abstracts are broken down into five sections covering the abatement and control of automobile exhaust: General studies (27 abstracts); Urban transportation planning and management (30 abstracts); Control methods (19 abstracts); Automotive fuel effects, additive effects, and new fuel types (23 abstracts); New engines (18 abstracts); and Exhaust analysis (17 abstracts). Smog and diesel engine research is excluded. (Author)

COM-73-11501/6GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
PLANNING AND IMPACT OF WATER RESOURCE PROGRAMS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1971-May 73,
Edward J. Lehmann. Jul 73, 131p* NTIS-WIN-73-036
Supersedes NTIS-PK-60.

Descriptors: (*Water resources, Management planning), (*Bibliographies, Water resources), (*Regional planning, Water resources), (*Public opinion, Water resources), Attitude surveys, Cost benefit analysis, Decision making, Land use, Economic factors.
Identifiers: Economic impact, Multiple purpose projects.

The report is an annotated bibliography containing over 110 selected abstracts covering the period of 1971 to May 1973 retrieved using the NTIS on-line search system--NTISearch. The purpose of the bibliography is to present information on the planning of water resource programs and projects and the means of evaluating their worth and impact. The report is divided into three sections, one on evaluation techniques, one on planning methods, and one on citizen attitudes. The section on evaluation covers the analysis of programs and projects either planned or built for their worth to and impact on the populace, the government, industries, water quality, and other environmental concerns. The planning section presents topics involving policies, objectives, management, and decision making of interest to national, state, or

local planners. The final section on citizen attitudes is provided in order to give an insight into the feelings of citizens toward such programs and projects. (Modified author abstract)

COM-73-11541/2GA Reprint
Wisconsin Univ., Madison. Graduate School of Business Administration.
RECREATION AND THE LOCAL ECONOMY: IMPLICATIONS FOR ECONOMIC AND RESOURCE PLANNING,
William A. Strang. 1971, 15p WIS-SG-72-310 NOAA-73070204
Pub. in Proceedings of the Marine Technology Society Annual Conference (7th), Aug 71 p509-521.

Descriptors: (*Recreation, Planning), (*Economic analysis, Recreation), Natural resources, Economic factors, Marketing, Recreational Facilities.
Identifiers: Tourism.

Unlike many industries, the outdoor recreation industry's short-run economic interests often call for the preservation rather than the exploitation of natural resources. Communities depending on these resources as primary demand generators for tourism have an interest in measuring the short-run economic value of the resources. The study demonstrates a method of organizing community economic data to measure the economic impact of tourism on an area. It further suggests how a community can increase the economic benefits of its tourist industry by segmenting its market. Finally, it suggests ways that the physical environment's economic value to the community can be determined with regard to the tourist industry. (Author)

COM-73-11550/3GA Reprint
Louisiana State Univ., Baton Rouge.
COMMENTARY--ON THE LIMITATIONS OF THE NATIONAL ENVIRONMENTAL POLICY ACT,
James H. Stone, John W. Day, Jr., Marc J. Hershman, William G. Smith, and Harold C. Loesch. 1973, 3p NOAA-73061906
Pub. in Ecology, v54 n2 p231-232, Early Spring 73.

Descriptors: (*Louisiana, *Environmental surveys), Coasts, Swamps, Land development, Regional planning.
Identifiers: *National Environmental Policy Act, *Wetlands, *Marshes, Sea Grant Program, *Coastal zone development, *New Orleans(Louisiana).

Though in general agreement with the value of the National Environmental Policy Act (NEPA) of 1969, members of the Department of Marine Sciences of the Louisiana State University at Baton Rouge point out its limitations in application to the wetland area surrounding and impinging upon New Orleans and Lake Pontchartrain, Louisiana. They suggest that NEPA should be amended to include specific criteria for the preparation of the environmental inventory of areas under possible impact. The inventory work should be done by an outside and objective agency, to obviate any collusive agreements, and include a means for setting priorities on the basis of the size or impact of a proposed action. All activities in a particular geographic region should be considered.

COM-73-11551/1GA PC$3.25/MF$1.45
Michigan Univ., Ann Arbor. Sea Grant Program.
THE STRUCTURE OF MANAGEMENT AND PLANNING FOR THE COASTAL ZONE,
John M. Armstrong. 1972, 25p NOAA-73062207
Presented at Woods Hole National Workshop on Critical Problems of the Coastal Zone, Woods Hole, Mass., 2 Jun 72.

Descriptors: (*Coasts, *Regional planning), Environmental surveys, Legislation, National government.
Identifiers: *Coastal zone development, Sea Grant Program.

The author explains that coastal zone management is the process of developing an understanding of the coastal zone as a system, using this knowledge to create a dynamic plan for its best use, and implementing and enforcing that plan. Since the coastal zone is a national resource, a national coastal zone management policy responsive to the needs and values of the citizenry should be established by the federal government. Consideration should be given to making provisions for such a policy to be administered by a single federal agency with coordination responsibility for other federal agencies with coastal zone responsibilities. The proposed policy should result in the enactment of appropriate and adequate legislation.

CONF-721030-/GA PC$6.00/MF$1.45
Division of Operational Safety (Aec), Washington, D. C.
PROCEEDINGS OF AEC POLLUTION CONTROL CONFERENCE, OAK RIDGE, TENNESSEE, OCTOBER 25--27, 1972.
Feb 73, 557p

Descriptors: (*Pollution, *Meetings), Contamination, Control, Environment, Leading abstract.

For abstract, see NSA 28 02, number 02563.

CONF-730323-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
MODELS, DIVERSE SKILLS, AND THE REAL WORLD.
C. R. Jr. Meyers. 1973, 9p

Descriptors: (*Environment, *Planning), (*Regional analysis, *Simulators), Transport.

For abstract, see NSA 28 03, number 07683.

COO-2158-7/GA PC$4.00/MF$1.45
Wisconsin Univ., Milwaukee. Center for Great Lakes Studies.
INVESTIGATION OF THE INFLUENCE OF THERMAL DISCHARGE FROM A LARGE ELECTRIC POWER STATION ON THE TEMPERATURE AND NEAR-SHORE CIRCULATION OF LAKE MICHIGAN. QUARTERLY PROGRESS REPORT, JANUARY 1--MARCH 31, 1973.
C. H. Mortimer, and G. K. Sato. 1973, 16p
Contract AT(11-1)-2158

Descriptors: (*Lake michigan, *Thermal pollution), Fluid flow, Power plants, Surface waters, Waste heat.

For abstract, see NSA 28 02, number 02620.

EIS-AA-73-1553-F/GA PC$7.50/MF$1.45
Forest Service, Washington, D. C.
PROPOSED OFF-ROAD VEHICLE REGULATIONS AND ADMINISTRATIVE INSTRUCTIONS.
Final environmental impact statement.
27 Sep 73, 110p ELR-73-1553, USDA-FS-FES(Adm)-73-49
Supersedes report dated Mar 73, EIS-AA-73-0390-D.

Descriptors: (*Environmental impact statements, *National parks), (*Regulations, *Motor vehicles), Government, Protection, Wildlife, Vegetation.

In accordance with Executive Order 11644 the regulations and administrative instructions provide for procedures that will ensure that the use of off-road vehicles on National Forest System lands will be controlled and directed so as to protect resources, promote safety of all users and minimize conflicts among the various uses of these lands. The regulations and administrative instructions are enclosed as appendix A and B. These regulations provide that recreational off-road vehicle use on the National Forest System lands be conducted to minimize the impact on the environment by reducing associated noise, protecting vegetation, wildlife, wildlife habitat, water and air quality, minimizing soil damage, promoting safety and welfare of the users and minimizing other use conflicts. Off-road vehicles used in mineral activities are excepted from the regulations and could produce some or all of the adverse environmental impacts which the regulations are intended to minimize. The Forest Service is in the process of issuing revised mining regulations that could minimize adverse impacts.

EIS-AA-73-1566-D/GA PC$6.00
Department of the Navy, Washington, D.C.
ABRASIVE BLASTING OF NAVAL SHIPS' HULLS.
Draft environmental impact statement.
1 Oct 73, 78p ELR-73-1566

Descriptors: (*Environmental impact statements, *Abrasive blasting), (*Naval ships, Abrasive blasting), Ship hulls, Air pollution, Water pollution, Chemicals.
Identifiers: Noise pollution.

The statement concerns the abrasive blasting (commonly called 'sandblasting') of the outside of naval ships' hulls at the Naval Ship Repair Facility, Guam, and Naval Shipyards at Boston, MA, Charleston, SC, San Francisco (Mare Island and Hunters Point), CA, Long Beach, CA, Norfolk, VA, Pearl Harbor, HI, Philadelphia, PA, Portsmouth, NH, and Puget Sound, WA. Environmental impacts and adverse environmental effects include: Air pollution resulting from suspended blast debris particles; water pollution from blast debris settling upon the water, from blast debris being pumped through drains and from chemicals that leach from landfills including attendant hazards to marine life; the risk of land pollution that results from the fallout of blast debris particulates from the air and from landfill operations; the use of land for residue disposal operations; noise pollution from the use of high pressure air delivery units and from impingement of blast particles.

EIS-AA-73-1571-F/GA PC$15.25/MF$1.45
Occupational Safety and Health Administration, Washington, D.C.
PROPOSED REGULATION: HANDLING OF CERTAIN CARCINOGENS.
Final environmental impact statement.
2 Oct 73, 262p ELR-73-1571
Supersedes report dated 3 May 73, EIS-AA-73-0871-D.

Descriptors: (*Environmental impact statements, *Carcinogens), (*Regulations, Carcinogens), (*Industrial medicine, Carcinogens), Chemicals, Protection, Government, Legislation, Insecticides, Textiles, Manufacturing, Dyes, Solvents, Ion exchange resins.

The Occupational Safety and Health Administration (OSHA) proposes to regulate the handling of fourteen chemicals (some of these are very basic raw materials used in many industries) deemed to have a carcinogenic potential for humans exposed in a work environment. The proposed regulation is intended to eliminate employee exposure to the carcinogens and thus provide increased protection from the debilitating and ruinous effects of cancer. The regulation will necessitate capital outlays by the firms involved, varying in accord with the type of operation and the extent to which the firm already complies. The effect of such outlays for firms for which substantial economic injury will result is mitigated by the availability of loans under the Small Business Act. A secondary benefit of the proposed regulation is likely to be a heightened search for substitutes not involving the carcinogens. The proposed standard does not totally regulate the emission of the carcinogens to the external environment as a result of the require-

ments for ventilation, waste disposal, and laundering. Other than this, there are no significant adverse impacts which cannot be avoided. The regulation will not sacrifice long-term goals for the sake of short-term goals, nor does it appear to make any irreversible or irretrievable demands on environmental resources.

EIS-AA-73-1586-D/GA PC$3.00
Energy Policy Office, Washington, D.C.
PROPOSED ESTABLISHMENT OF PRIORITIES OF USE AND ALLOCATIONS OF SUPPLY FOR CERTAIN LOW SULFUR PETROLEUM PRODUCTS.
Draft environmental impact statement.
7 Sep 73, 31p* ELR-73-1586

Descriptors: (*Environmental impact statements, Fuels), (*Government policies, *Fuels), (*Air pollution, Government policies), National government, Sulfur, Water pollution, Land use, Coal, Fuel oil, Standards.
Identifiers: *Low sulfur fuels, Air pollution standards.

The statement concerns a proposed action which would temporarily prohibit utilities and other large fuel users from switching from coal or residual fuel oil to lower sulfur petroleum fuels and prohibit increases in the quantity of distillates blended into residual oils, except where such actions are absolutely necessary to meet primary ambient air quality standards. The main impact would be on air quality; however, the proposed action would not adversely affect existing air quality but would defer altogether for less than a year the improvement of air quality standards in the areas affected. Minor land use and water quality impacts would occur also. These aspects are discussed.

EIS-CA-73-1559-D/GA PC$5.75
Army Engineer District, San Francisco, Calif.
SPECIAL PROJECT ML-71 (REVISED), MAINTENANCE DREDGING, NAVAL AIR STATION, ALAMEDA, CALIFORNIA.
Draft environmental impact statement.
28 Sep 73, 72p ELR-73-1559

Descriptors: (*Environmental impact statements, *Dredging), (*California, Environmental impact statements), Maintenance, Channel improvements, Waste disposal, Waterways(Transportation), Water quality.
Identifiers: Alameda County(California).

The project proposed maintenance dredging of the Naval Air Station Alameda channel, turning basin and berthing area to 42 foot depth. Approximately 1.5 million cubic yards of dredged material will be deposited at the Alcatraz disposal site on a one time basis in the summer of 1973 under provisions of California Regional Water Quality Control Board, San Francisco Bay Region, Resolution 72-15. Safe navigational operations and berthing of deep draft vessels at NAS Alameda's port facilities will be allowed to continue, thereby maintaining the socio-economic benefits accrued from these activities. Adverse environmental effects include: Removal of the present interface between the water and bottom and release of sediments into water column; slight interference with phytoplankton production; temporary fish avoidance of disposal area; possible release of toxic substances to estuarine environment.

EIS-CA-73-1579-D/GA PC$3.00
Veterans Administration, Washington, D.C.
A 120 BED REHABILITATION/NURSING HOME CARE BUILDING AT THE VETERANS ADMINISTRATION HOSPITAL, SEPULVEDA, CALIFORNIA.
Draft environmental impact statement.
2 Oct 73, 20p ELR-73-1579

Descriptors: (*Environmental impact statements, *Hospitals), (*California, Environmental impact statements), Nursing, Military personnel, Military facilities, Rehabilitation, Medical services, Improvement.
Identifiers: Veterans benefits, Nursing homes, Sepulveda(California).

The statement proposes the construction of a 120 bed rehabilitation/nursing home care building on the property of the VA Hospital in Sepulveda, California. The area most affected by this action is Los Angeles County. Favorable environmental impact includes the provision of better care for the health needs of the veterans of the area, improved traffic circulation on the VA Hospital site, and a greater dispersion of traffic on adjacent city streets. Adverse environmental impact is negligible.

EIS-CO-73-1542-D/GA PC$5.25
Routt National Forest, Steamboat Springs, Colo.
MANAGEMENT OF THE DAVIS PEAK AND ELKHORN MOUNTAIN ROADLESS AREAS.
Draft environmental impact statement.
25 Sep 73, 64p ELR-73-1542, USDA-FS-DES(Adm)-74-31

Descriptors: (*Environmental impact statements, *National parks), (*Colorado, Environmental impact statements), Management, Access roads, Construction, Lumbering, Elkhorn Mountain.
Identifiers: Routt National Forest, Routt County(Colorado).

The project proposed the management of 5550 acres in the northwest corner of the Davis Peak Roadless Area and 1880 acres in the northeast corner of the Elkhorn Mountain Roadless area on the Routt National Forest, Routt County, Colorado. The primary management activity of the forested areas will be the application of proper silvicultural (tree culturing) techniques. Initial activities will consist of constructing roads to facilitate harvesting timber. One primary impact would be the loss of wilderness suitability of 7430 acres from the total of 111,652 acres comprising the Davis Peak and Elkhorn Mountain Roadless Areas. Another primary impact is the sustained increase in the Nation's wood supply from this area as the timber stands are managed.

EIS-CO-73-1568-D/GA PC$7.25
Rural Electrification Administration, Washington, D.C.
TRANSMISSION LINE, 115 KV, LONGMONT NORTHEAST SUBSTATION TO DEL CAMINO SUBSTATION, COLORADO.
Draft environmental impact statement.
1 Oct 73, 104p USDA-REA-ES(Adm)-73-10-D ELR-73-1568
Prepared in cooperation with Tri-State Generation and Transmission Association, Inc., Denver, Colo.

Descriptors: (*Environmental impact statements, *Transmission lines), (*Colorado, Environmental impact statements), Construction, Electric power transmission, Electric substations.
Identifiers: Boulder County(Colorado), Weld County(Colorado).

Tri-State Generation and Transmission Association, Inc. proposes to build an 8.5 mile 115 kV transmission line from the city of Longmont's Northeast substation due east to Union Rural Electric Association's (Union REA) proposed Del Camino substation. The land along the transmission right-of-way is rolling uplands and stream valley lowlands. Most of the land in the area is irrigated cropland; some suburban, commercial, and industrial developments are occurring. The construction of the proposed transmission line requires a small area to be removed from agricultural use for the transmission poles. Construction will cause a minor amount of temporary disruption to the environment. The visual intrusion of the transmission line on the landscape will be minimized by the use of modern-ornamental type, single-pole structures and crossing existing roads at or near 90 degrees.

EIS-DC-73-1567-F/GA PC$22.25/MF$1.45
National Capital Planning Commission, Washington, D.C.
THE DWIGHT D. EISENHOWER MEMORIAL BICENTENNIAL CIVIC CENTER AND RELATED MODIFICATIONS TO THE COMPREHENSIVE PLAN FOR THE NATIONAL CAPITAL.
Final environmental impact statement.
1 Oct 73, 401p ELR-73-1567
Supersedes report dated 3 Aug 73, EIS-DC-73-1290-D.

Descriptors: (*Environmental impact statements, *Public buildings), (*District of Columbia, Environmental impact statements), Construction, Central city, Sanitary engineering, Eminent domain, Relocation.

The project proposes the development of a civic center in the downtown area of the District of Columbia. The civic center site is comprised of 10.31 acres bounded by Eighth Street, H Street, Tenth Street, New York Avenue, and K Street. It includes the right-of-way of I Street, NW., between Eighth and Tenth Street, and the use of the air-rights over Ninth Street for the structure. The facility will provide a meeting place for regional and national conventions, trade fairs, and public admission shows. It will contain approximately 640,000 gross square feet of enclosed floor area, and will be used by approximately 925,000 persons annually. The proposed modifications to the Comprehensive Plan include changing the designated use of the site to 'Other Major Institution,' and changing the designations of limited portions of New York Avenue, K Street, and Massachusetts Avenue to 'Major Arterial' while removing that designation on a segment of I Street. Environmental impacts and adverse environmental effects are discussed.

EIS-DE-73-1572-D/GA PC$3.25
Army Engineer District, Philadelphia, Pa.
LITTLE MILL CREEK, DELAWARE.
Draft environmental impact statement.
2 Oct 73, 25p ELR-73-1572

Descriptors: (*Environmental impact statements, *Channel improvements), (*Delaware, Environmental impact statements), Dams, Flood control, Erosion, Vegetation, Benthos.

The report describes proposed construction of a dry dam on the Little Mill Creek, channel modifications on the Derrickson Run and the Little Mill Creek, clearing the existing channel of Chestnut Run, addition to the B and O Railroad Wilsmere yards bridge crossing the Little Mill Creek, and replacing a culvert at Richards Avenue for flood control purposes. The project will have a beneficial effect on the surrounding area in that it will greatly reduce damage from flooding and erosion. Adverse environmental effects include destruction of vegetation in the vicinity of the dry dam and access roads and alteration of stream beds due to channel modifications. These modifications will alter the ecosystem of the Little Mill Creek and its tributaries and reduce aquatic productivity.

EIS-FL-73-1543-D/GA PC$4.00
Army Engineer District, Mobile, Ala.
APALACHICOLA BAY, FLORIDA (MAINTENANCE DREDGING).
Draft environmental impact statement.
25 Sep 73, 39p ELR-73-1543

Descriptors: (*Environmental impact statements, *Dredging), (*Florida, Environmental impact statements), Channel improvements, Maintenance, Spoil, Sediments, Aquatic animals, Apalachicola Bay.

The project proposes to maintain the required depths of 10 feet in the St. George Island Channel and six feet in the East Point and Two Mile Channels as required. The St. George Island Channel normally requires annual maintenance dredging

and the East Point and Two Mile Channels are on a five-year schedule. Spoil from the East Point and Two Mile Channels is in open-water sites, while spoil from the St. George Island Channel is used for beach nourishment. While maintaining capacity of the channels for efficient and safe movement of commercial and recreational navigation, the action will destroy a relatively small amount of benthic organisms on the affected channel bottoms and on open-water spoil disposal sites, and will temporarily increase turbidity and siltation near the dredge and the open-water disposal areas. The action may, if uncontrolled in-water spoil disposal is employed, create sufficient levels of siltation and turbidity to be detrimental to the larvae and/or eggs of various aquatic species, and/or to the general productivity of the areas in the vicinity of the action.

EIS-FL-73-1549-D/GA PC$3.00
Army Engineer District, Jacksonville, Fla.
CANAVERAL HARBOR EXTENSION, FLORIDA.
Draft environmental impact statement.
27 Sep 73, 18p ELR-73-1549

Descriptors: (*Environmental impact statements, *Dredging), (*Florida, Environmental impact statements), Harbors, Channel improvements, Disposal, Waterways(Transportation).
Identifiers: Cape Canaveral(Florida), Brevard County(Florida).

The project consists of the dredging of a 31-foot-deep, 300-foot-wide, and 1,540-foot-long ship channel. About 500,000 cubic yards of material will be removed from the harbor and placed in a previously used disposal area which is now covered periodically by tidal action. The dredging will cause temporary turbidity and removal of the existing benthic organisms. No objections were raised to the use of the proposed disposal area.

EIS-FL-73-1551-D/GA PC$4.25
Army Engineer District, Mobile, Ala.
LA GRANGE BAYOU (MAINTENANCE DREDGING), WALTON COUNTY, FLORIDA.
Draft environmental impact statement.
27 Sep 73, 41p ELR-73-1551
Prepared by University of Alabama Marine Science Program, Dauphin Island, Ala.

Descriptors: (*Environmental impact statements, *Dredging), (*Florida, Environmental impact statements), Maintenance, Channel improvements, Waterways(Transportation), Economic development.
Identifiers: Walton County(Florida).

The project proposes continuation of routing maintenance dredging of Federally authorized navigation project consisting of a channel 12 feet deep and 100 feet wide from the 12 foot depth contour in Choctawhatchee Bay to the Florida Highway 83A bridge crossing Fourmile Creek at Freeport, Florida. The project includes a turning basin 200 feet wide, 400 feet long and 12 feet deep at Freeport in Fourmile Creek. The proposed action will provide an adequate channel for pleasure and commercial watercraft. This will permit continuing production and expansion by local industries. There will be a loss of bottom dwelling organisms, temporary lowering of water quality, and loss of vegetation due to spoiling.

EIS-FL-73-1578-D/GA PC$4.00
Army Engineer District, Jacksonville, Fla.
VIRGINIA KEY BEACH EROSION CONTROL PROJECT, SECOND PERIODIC NOURISHMENT AND GROINS.
Draft environmental impact statement.
2 Oct 73, 37p ELR-73-1578

Descriptors: (*Environmental impact statements, Groins(Structures)), (*Florida, Environmental impact statements), Beach erosion, Construction, Dredging, Beach nourishment, Water quality, Virginia Key.

The project proposes hydraulic excavation and placement of 100,000 cubic yards of sand on 1.3 miles of the ocean shore of Virginia Key to provide 70 feet of level beach berm at elevation 6 feet mean low water, and construction of one impermeable and 12 permeable groins. Material for beach nourishment will come from the Miami Harbor deepening project. Environmental impacts include prevention of beach erosion. Beach fill sites will cause destruction of marine invertebrates and vegetation, and water quality will be degraded.

EIS-HI-73-1570-D/GA PC$3.00
Army Engineer Div. Pacific Ocean, Honolulu, Hawaii.
PREVENTION AND MITIGATION OF SHORE DAMAGES, KAHULUI HARBOR, MAUI.
Draft environmental impact statement.
1 Oct 73, 13p ELR-73-1570

Descriptors: (*Environmental impact statements, *Harbor structures), (*Hawaii, Environmental impact statements), Revetments, Breakwaters, Construction, Turbidity, Shore protection, Recreation, Kahului Harbor, Groins(Structures).

The proposed plan for shoreline protection and beach restoration consists of the construction of about 760 feet of revetment along Kahului Beach Road, the placement of about 11,000 cubic yards of sand along the southern shoreline of Kahului Harbor, and construction of one groin extension, two new groins, and one offshore breakwater to protect the sand placement. Impacts related to the construction period include some turbidity of the water, disturbance to fish and marine life, and some interference with recreational activities. The revetment will prevent further erosion of the western shoreline and maintain continued, safe use of Kahului Beach Road. The sand placement and protective structures will result in increased beach area and consequently, greater recreational benefits along the southern shore. No long-term adverse effects are anticipated.

EIS-IA-73-1548-D/GA PC$4.50
Federal Highway Administration, Ames, Iowa. Iowa Div.
U.S. 65 IN POLK AND JASPER COUNTIES FROM BONDURANT TO THE JUNCTION OF COUNTY ROAD F-18, IOWA.
Draft environmental impact statement.
Sep 73, 50p FHWA-IOWA-EIS-73-07-D ELR-73-1548
Prepared by Iowa State Highway Commission.

Descriptors: (*Environmental impact statements, *Highways), (*Iowa, Environmental impact statements), Construction, Divided highways, Eminent domain.
Identifiers: US highway 65, Polk County(Iowa), Jasper County(Iowa).

The proposed project involves the construction of two new lanes on additional right-of-way to be purchased on the southeast side of the present U.S. Highway 65 alignment. Traffic will continue to use the existing lanes during construction; however, once the new lanes are available the existing ones will be removed. At some future date when traffic volume warrant, two additional lanes will be constructed on the existing right-of-way thus developing a four-lane divided facility. The project will begin at a point southeast of Bondurant and terminate at the junction of Jasper County Road F-18. The project length will be 11.6 miles. The proposed project will displace five residences and two entire farmsteads. It will remove cropland from productivity and some timber, both of which are also wildlife habitats. It will cross Indian Creek with two bridges and relocate the alignment of Iowa 117 at the interchange with U.S. Highway 65. The noise and exhaust emissions in the corridor will increase due to increases in traffic volumes. Benefits to be derived from the improvement will consist of safer and more efficient transportation.

EIS-KS-73-1560-F/GA PC$4.75/MF$1.45
Army Engineer District, Kansas City, Mo.
NAVIGATION OF THE KANSAS RIVER, LAWRENCE TO THE MOUTH.
Final environmental impact statement.
28 Sep 73, 52p ELR-73-1560
Supersedes report dated May 72, PB-209 050.

Descriptors: (*Environmental impact statements, *Dredging), (*Kansas, Environmental impact statements), Rivers, Waterways(Transportation), Revetments, Maintenance, Stabilization, Kansas River.

The project recommends training and bank stabilization work, dredging of the channel, dredging of the turning basin, diking, revetments, and maintenance dredging for the purpose of navigation. Environmental impacts include: Temporary destruction of benthic organisms during dredging; accelerated industrial development; increased turbidity; improved access to river; increased danger of oil spills, leaks, and other discharges. Adverse environmental effects temporary disruption of local environment during construction and maintenance dredging; increased potential for oil spills, leaks, and other discharges; accelerated development would contribute to loss of riverfront vegetation.

EIS-KY-73-1550-D/GA PC$3.00
Army Engineer District, Louisville, Ky.
MARKLAND LOCKS AND DAM HIGHWAY BRIDGE AND APPROACHES KENTUCKY AND INDIANA.
Draft environmental impact statement.
27 Sep 73, 10p ELR-73-1550

Descriptors: (*Environmental impact statements, *Highway bridges), (*Kentucky, Environmental impact statements), Construction, Bridge approaches, Economic development.
Identifiers: Gallatin County(Kentucky).

The project proposes construction of a two-lane highway bridge, supported by the Markland Dam, crossing the Ohio River 531.5 river miles below Pittsburgh, Pennsylvania. The project will also include construction of short approach roads on each side of the river to connect the bridge to existing highways. Provisions to accomodate this structure were included in the design and construction of Markland Dam. Traffic flow in the vicinity of the bridge will be facilitated and increased, with a resultant stimulus to economic growth. Some road construction and improvement may occur as a result of the bridge. Switzerland County in Indiana will gain an improved access to the interstate highway system. The project will cause the abandonment of two privately owned ferries in the vicinity. A small amount of land on each side of the bridge would be required for construction of approach roads. Some additional land may be lost if other road construction occurs as a result of the project. The level of air and noise pollution in the area will increase. The redirected traffic will result in trade losses in some areas.

EIS-KY-73-1583-F/GA PC$5.50/MF$1.45
National Park Service, Richmond, Va. Southeast Region.
PROPOSED WILDERNESS CLASSIFICATION, CUMBERLAND GAP NATIONAL HISTORIC PARK, KENTUCKY, TENNESSEE, VIRGINIA.
Final environmental impact statement.
3 Oct 73, 66p ELR-73-1583, FES-73-54
Supersedes report dated Sep 72, EIS-KY-72-5298-D.

Descriptors: (*Environmental impact statements, *National parks), (*Kentucky, Environmental impact statements), Natural resources, Protection, Management, Tennessee, Virginia.

Identifiers: Cumberland Gap National Historic Park.

Proposed for wilderness designation are 6375 acres in Cumberland Gap National Historical Park, Kentucky, Tennessee and Virginia for inclusion in the National Wilderness Preservation System. Additionally, 3810 acres are recommended as a potential wilderness. The proposed wilderness designation provides additional legislative protection to the natural environment of a significant area of primitive lands. Adverse effects include possible rationing of visitor use, curtailment of mode of access, increased management costs, and restriction of management options.

EIS-LA-73-1564-F/GA PC$9.00/MF$1.45
Army Engineer District, New Orleans, La.
BRUSH BAYOU, LOUISIANA. ASSOCIATED WATER FEATURE, BOGGY AND CYPRESS BAYOUS, WALLACE LAKE.
Final environmental impact statement.
28 Sep 73, 139p ELR-73-1564
Supersedes report dated Dec 72, EIS-LA-73-0572-D.

Descriptors: (*Environmental impact statements, *Channel improvements), (*Louisiana, Environmental impact statements), Flood control, Land use, Forest land, Wildlife, Spoil, Relocation, Brush Bayou.
Identifiers: Shreveport(Louisiana).

The project proposes enlargement and/or realignment of 6.22 miles of the Brush Bayou channel to reduce flood stages and related damages to urban developments located near this bayou. Implementation of the proposed plan involves removal and disposal of about 2 million cubic yards of spoil, relocation and/or modification of four bridges and 28 utility crossings, and initiation of beautification measures. The Brush Bayou project area is a tributary to the Wallace Lake drainage basin which is located in the northwest portion of the state of Louisiana. More specifically, the area is for the most part within the corporate limits of the city of Shreveport, Caddo Parish, Louisiana. The recommended physical alterations to Brush Bayou will provide flood protection on about 730 acres of flood plain lands and their existing developments. The project will enhance intensive development and utilization of about 615 acres of land for urban expansion. Implementation will induce land use changes of those areas dedicated to project features and urban expansion. These changes in land use will impose minor adverse impacts to the existing forest, wildlife, water and aquatic resources of the Brush Bayou drainage area.

EIS-MN-73-1533-F/GA PC$5.75/MF$1.45
Federal Highway Administration, St. Paul, Minn. Minnesota Div.
INTERSTATE 90 AND U.S. T.H. 169, FARIBAULT COUNTY, MINNESOTA.
Final environmental impact statement.
21 Sep 73, 73p FHWA-MN-EIS-72-3-F ELR-73-1533
Supersedes report dated Jun 73, EIS-MN-73-0966-D. Prepared by Minnesota State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*Minnesota, Environmental impact statements), (*Interstate highway system, Environmental impact statements), Construction, Traffic safety, Eminent domain.
Identifiers: Interstate highway 90, Faribault County(Minnesota), US highway 169.

The I-90 project begins approximately 1.3 miles west of the present junction of U.S. Highway 169. Proceeding easterly, the proposed route crosses the Blue Earth River and inplace U.S. Highway 169 (north of the city of Blue Earth) and terminates approximately 1.2 miles east of inplace U.S. Highway 169. The I-90 project length is 2.5 miles. The improvement will provide a 4-lane divided roadway with full control of access. The U.S. Highway 169 project begins on present U.S. Highway 169, 1.0 mile south of the South Corporate Limits of the city of Blue Earth and terminates 1/4 mile north of County State Aid Highway (CSAH) 8 north of the city of Blue Earth. The U.S. Highway 169 project length is approximately 4.8 miles. The projects will require approximately 53 ac/mile of agricultural lands for I-90 and 40 ac/mile for a part of U.S. Highway 169 construction. The proposed construction will cause the displacement of about six families and three commercial businesses. Access will be fully controlled on I-90 and partially controlled on U.S. Highway 169.

EIS-MO-73-1552-F-1/GA PC$23.25/MF$1.45
Army Engineer District, St. Louis, Mo.
MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI. VOLUME I.
Final environmental impact statement (Rev. and Suppl.)
27 Sep 73, 425p ELR-73-1552-F-1
Supersedes report dated Apr 73, EIS-MO-73-0996-D-1. See also EIS-MO-73-1552-F-2.

Descriptors: (*Environmental impact statements, *Flood control), (*Missouri, Environmental impact statements), Dams, Lakes, Recreation, Water quality, Water supply, Economic development, Waterways(Transportation), Eminent domain.
Identifiers: Crawford County(Missouri).

The Meramec Park Lake will be located in Crawford County, Missouri, with small portions in the abutting counties of Washington and Franklin. The impoundment will be formed by the construction of a dam on the Meramec River at river mile 108.7 above the confluence of the Meramec and Mississippi Rivers. The purposes of the lake are recreation, flood control, water quality, water supply, recreation, fish and wildlife, navigation and area redevelopment. The lake will have a normal pool of 12,600 acres. Environmental impacts include: Inundation of wildlife habitat; flood protection to urban and rural areas; changes in land use; landscape diversity; long-term economic effect on the region. Adverse environmental effects include: Change in land use and the resultant effect on the agricultural sector of the economy; inundation of archeological sites; hardship on residents who are forced to relocate; downstream development as a result of project provided flood protection would cause increased pressure on the existing ecosystem.

EIS-MO-73-1552-F-2/GA PC$16.00/MF$1.45
Army Engineer District, St. Louis, Mo.
MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI. VOLUME 2.
Final environmental impact statement (Rev. and Suppl.)
27 Sep 73, 279p ELR-73-1552-F-2
Supersedes report dated Apr 73, EIS-MO-73-0996-D-2. See also EIS-MO-73-1552-F-3.

Descriptors: (*Environmental impact statements, *Flood control), (*Missouri, Environmental impact statements), Dams, Lakes, Recreation, Water quality, Water supply, Economic development, Waterways(Transportation), Eminent domain.
Identifiers: Crawford County(Missouri).

A number of public hearings and informational meetings were held regarding the plan for the development of the Meramec Basin. All of these included the construction of Meramec Park Lake prior to and following passage of the Flood Control Act of 1966 which modified the Meramec Park Lake project and included it in the overall plan for development of the basin. The public hearings are included in the report.

EIS-MO-73-1552-F-3/GA PC$9.75/MF$1.45
Army Engineer District, St. Louis, Mo.
MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI. APPENDIX A THROUGH L.
Final environmental impact statement (Rev. and Suppl.).
27 Sep 73, 151p ELR-73-1552-F-3
Supersedes report dated Apr 73, EIS-MO-73-0996-D-3. See also EIS-MO-73-1552-F-4.

Descriptors: (*Environmental impact statements, *Flood control), (*Missouri, Environmental impact statements), Dams, Lakes, Recreation, Water quality, Water supply, Economic development, Waterways(Transportation), Eminent domain.
Identifiers: Crawford County(Missouri).

The document contains the appendices as regards the flood history of the Meramec Basin.

EIS-MO-73-1552-F-4/GA PC$10.75/MF$1.45
Army Engineer District, St. Louis, Mo.
MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI. APPENDIX M. LETTERS OF REPLY RECEIVED ON THE DRAFT ENVIRONMENTAL STATEMENT.
Final environmental impact statement (Rev. and Suppl.).
27 Sep 73, 173p ELR-73-1552-F-4
Supersedes report dated Apr 73, EIS-MO-73-0996-D-1. See also EIS-MO-73-1552-F-1.

Descriptors: (*Environmental impact statements, *Flood control), (*Missouri, Environmental impact statements), Dams, Lakes, Recreation, Water quality, Water supply, Economic development, Waterways(Transportation), Eminent domain.
Identifiers: Crawford County(Missouri).

EIS-MT-73-1537-D/GA PC$7.25
Bonneville Power Administration, Portland, Oreg.
HUNGRY HORSE CLOUD SEEDING PROJECT.
Draft environmental impact statement.
24 Sep 73, 102p ELR-73-1537, DES-73-57

Descriptors: (*Environmental impact statements, *Cloud seeding), (*Montana, Environmental impact statements), Stream flow, Hydroelectric power generation, Snowfall, Silver iodide.
Identifiers: Flathead County(Montana), Lake County(Montana).

A November 15, 1973 - April 15, 1974, cloud seeding project in Flathead and Lake Counties, Montana, is directed toward the maintenance of normal snowpack conditions in the basin of the South Fork of the Flathead River above Hungry Horse Dam. The purpose is to help alleviate a projected shortage of firm energy in the Pacific Northwest by assuring normal streamflows and hydroelectric generation. Environmental impacts and adverse environmental effects include: A possible increase up to 10% in snowpack over a 1,034,600 acre target area in the winter of 1973-74 with the resultant transitory and minor impacts on wildlife, vegetation, soil erosion, and streamflow; and some inconveniences to local residents. These effects are expected to be within the range of those resulting from natural snowfall variations. Approximately 18 pounds of silver iodide will be released over the study area. In the event of a heavy late-season snowfall, the snowpack resulting from the proposed project could contribute to a heavier-than-normal runoff.

EIS-MT-73-1576-F/GA PC$4.75/MF$1.45
Gallatin National Forest, Bozeman, Mont.
MULTIPLE USE PLAN, NORTH BRIDGER PLANNING UNIT. BOZEMAN RANGER DISTRICT, GALLATIN NATIONAL FOREST, NORTHERN REGION.
Final environmental impact statement.
2 Oct 73, 51p ELR-73-1576, USDA-FS-FES(Adm)-74-2
Supersedes report dated Jul 73, EIS-MT-73-1116-D.

Descriptors: (*Environmental impact statements, *National parks), (*Montana, Environmental impact statements), Forest land, Roads, Management, Land use, Structural timber, Wildlife.
Identifiers: Gallatin County(Montana).

The report proposes implementing a multiple use management plan for the North Bridger Mountains, Bozeman Ranger District, Gallatin National Forest in Gallatin County, Montana. The total area is about 60,000 acres, 42,000 of which are national forest land. The plan calls for building a new road, a trail, improving other roads, harvesting timber on some areas, and maintaining other areas in a roadless condition. The plan also outlines direction for managing domestic livestock, wildlife populations and ranges, and the Fairy Lake area. Environmental impacts are building of new roads and improving others, harvesting timber, grazing domestic stock and wildlife, regulating motorized vehicle use, and providing recreation facilities. Also included are loss of 5,000 acres of roadless area; loss of timber production in roadless area; temporary loss of game cover; increase in sedimentation; aesthetic impact and slash from timber harvest; and soil disturbance by cattle and game grazing.

EIS-NC-73-1590-F/GA PC$4.75/MF$1.45
Federal Highway Administration, Raleigh, N.C. North Carolina Div.
NC 107, CULLOWHEE, JACKSON COUNTY, NORTH CAROLINA. PROJECT. 6.801869.
Final environmental impact statement.
4 Oct 73, 55p FHWA-NC-EIS-71-18-F ELR-73-1590
Supersedes report no. PB-201 398-D. Prepared by North Carolina State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*North Carolina, Environmental impact statements), Construction, Rural areas, Eminent domain, Natural resources.
Identifiers: North Carolina route 107, Cullowhee(North Carolina), Jackson County(North Carolina).

The N.C. Department of Transportation proposes to construct a relocation of NC 107 west of Cullowhee in Jackson County. The project will replace an existing outmoded two-lane facility with a modern, safer, and more efficient four-lane divided highway that will meet the local and regional traffic needs and accommodate the major traffic desires to Western Carolina University in Cullowhee. The project will require right of way through agricultural and wood lands and displacement of 18 families. Natural scenery will be affected by the clearing of forests, earthwork, and construction scars. Temporary disturbance to fishery is expected from construction of minor channel changes on Cullowhee Creek and Tuckaseigee River. Portions of the project will cross and parallel Tuckaseignee River and Cullowhee Creek, and the possibility of siltation of these streams will exist during construction of the project.

EIS-NM-73-1516-F/GA PC$18.50/MF$1.45
Department of State, Washington, D.C.
POSSIBLE OPTIONS FOR REDUCING THE SALINITY OF THE COLORADO RIVER WATERS FLOWING TO MEXICO.
Final enviromental impact statement.
26 Sep 73, 329p ELR-73-1516
Prepared in Conjunction with an Interagency Study on This Problem dated December 1972, that was Directed by the Honorable Herbert Brownell.

Descriptors: (*Environmental impact statements, *Desalting), (*New Mexico, Environmental impact statements), Colorado River, Irrigation, Canals, Weather modification, Water resources.

The statement summarizes the anticipated environmental effects of a variety of postulated ways in which the U.S. might further reduce the salinity of the Colorado River waters being delivered to Mexico. The alternatives considered in the impact statement include: nine different desalting projects, including facilities that would desalt the return flows from the Wellton-Mohawk Irrigation District; relining a portion of Coachella Canal; adopting improved irrigation techniques to save water; shutting down all or a portion of the Wellton-Mohawk District to remove or reduce the flows now contributing to the salinity of the Colorado River waters; possibly using, in time, weather modification techniques to augment the water resources in the Colorado Basin; and such theoretical possibilities as bypassing all Wellton-Mohawk flows indefinitely (and replacing them with storage water) or placing a moratorium on all future Federally supported development prospects in the Colorado Basin. Environmental impacts and adverse environmental effects are discussed.

EIS-OK-73-1557-F/GA PC$4.75/MF$1.45
Army Engineer District, Tulsa, Okla.
DEEP FORK LOGJAM, DEEP FORK RIVER, OKLAHOMA.
Final environmental impact statement.
28 Sep 73, 54p ELR-73-1557
Supersedes report dated Jul 73, EIS-OK-73-1160-D.

Descriptors: (*Environmental impact statements, *Wooden logs), (*Oklahoma, Environmental impact statements), Removal, Rivers, Clearing, Deep Fork River, Flood control, Drainage.
Identifiers: Creek County(Oklahoma), Okfuskee County(Oklahoma).

The project consists of removing a logjam from Deep Fork of the Canadian River three miles north and one mile east of Okfuskee, OK. The logjam is located in Creek and Okfuskee Counties, OK. Removal of the logjam will reestablish drainage of bottomlands used for agriculture, and will reduce flooding. Bank caving and erosion will be reduced by clearing the logjam from the natural channel. Clearing and log disposal will affect natural vegetation; however, natural conditions will not be disturbed except where necessary. An increase in turbidity will occur during the construction period.

EIS-OR-73-1547-F/GA PC$4.50/MF$1.45
Army Engineer District, Walla Walla, Wash.
BEECH CREEK, MT. VERNON, OREGON. FLOOD CONTROL CHANNEL.
Final environmental impact statement.
26 Sep 73, 47p ELR-73-1547
Supersedes report dated Dec 72, EIS-OR-73-0078-D.

Descriptors: (*Environmental impact statements, *Flood control), (*Oregon, Environmental impact statements), Channel improvements, Bridges, Community development.
Identifiers: Mount Vernon(Oregon), Grant County(Oregon).

The project would provide a flood control channel through the City of Mt. Vernon, Grant County, Oregon. About 10 acres of land would be used and two existing bridges would require alteration. A high degree of flood protection would be provided to insure long-term security and to allow continued community development. In addition to providing flood protection, the work would modify the appearance of the existing channel and will require provision of a fishway to accommodate anadromous fish migration. The existing streambank vegetation would be displaced and a rock quarry would be needed. Temporary disturbance in the community would occur during the construction activity.

EIS-OR-73-1569-D/GA PC$19.25
Federal Highway Administration, Salem, Oreg. Oregon Div.
ST. HELENS ROAD-21ST AVENUE SECTION INTERSTATE 505, INDUSTRIAL FREEWAY, OREGON.
Draft environmental impact statement.
1 Oct 73, 342p FHWA-OR-EIS-73-08-D ELR-73-1569
Prepared by Oregon State Highway Div.

Descriptors: (*Environmental impact statements, *Highways), (*Oregon, Environmental impact statements), Freeways, Right of way acquisition, Relocation, Residential buildings, Commercial buildings, Engine noise.
Identifiers: Portland(Oregon), Multnomah County(Oregon).

The project involves the adoption of an urban freeway location in Northwest Portland in Multnomah County, Oregon, to connect with Interstate I-405 and serve as an extension of U.S. Highway 30. Environmental impacts include improved traffic networks, land use, relocation of residential and commercial buildings, noise and pollution.

EIS-SC-73-1574-D/GA PC$3.50
Federal Highway Administration, Columbia, S.C. South Carolina Div.
PROPOSED BEAUFORT RIVER CROSSING NEAR BEAUFORT, SOUTH CAROLINA. (BEAUFORT COUNTY).
Draft environmental impact statement.
2 Oct 73, 30p FHWA-SC-EIS-73-07-D ELR-73-1574
Prepared by South Carolina State Highway Dept.

Descriptors: (*Environmental impact statements, *Highway bridges), (*South Carolina, Environmental impact statements), Construction, Traffic engineering, Swamps, Silts, Right of way acquisition, Beaufort River.
Identifiers: Beaufort County(South Carolina).

The project involves the construction of a multilane facility from S.C. route 281 on Port Royal Island to U.S. route 21 on Ladies Island in Beaufort County. The approximate length of the project is between 2.9 and 4.1 miles (depending on alternate) and involves a bridge over the Beaufort River which is a portion of the intracoastal waterway. Environmental impacts include an improved traffic flow between Port Royal Island and Ladies Island; a fixed span structure across the river; crossing of considerable marsh land; temporary siltation and increased turbidity during bridge construction; and acquisition of right of way for the length of the project.

EIS-SC-73-1575-D/GA PC$3.00
Federal Highway Administration, Columbia, S. C. South Carolina Div.
THE PROPOSED LOCATION OF THE S.C. ROUTE 61 EXPRESSWAY AND U.S. ROUTE 17 CONNECTOR NORTHWEST OF THE CITY OF CHARLESTON, SOUTH CAROLINA, IN CHARLESTON COUNTY.
Draft environmental impact statement.
2 Oct 73, 18p FHWA-SC-EIS-73-05-D ELR-73-1575
Prepared by South Carolina State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*South Carolina, Environmental impact statements), Construction, Freeways, Right of way acquisition, Forest land, Buildings, Relocation.
Identifiers: South Carolina route 61, Charleston County(South Carolina).

The statement discusses approval for location of the proposed freeway which would be approximately 11 miles in length, beginning just north of S.C. Route 7 and continuing northwesterly until connecting with the present S.C. Route 61. The proposed connector would extend from the freeway in an area north of Church Creek and eventually tie in with existing U.S. Route 17, a distance of approximately 2 miles. The entire project is located northwest of the city of Charleston, S.C. in Charleston County. Environmental impacts would involve the acquisition of approximately 250 feet in right of way for the freeway, as well as connector and would displace approximately ten

buildings. Sections of roadway fill would be necessary as a large portion of the project traverses undeveloped lowlands. Forests of several types would also be involved in obtaining the necessary right of way along with possible marshland at Church Creek.

EIS-SD-73-1539-D/GA PC$3.25
Federal Highway Administration, Pierre, S. Dak. South Dakota Div.
CONSTRUCTION OF APPROXIMATELY 1.5 MILES OF HIGHWAY IN SIOUX FALLS, SOUTH DAKOTA (MINNEHAHA COUNTY).
Draft environmental impact statement.
24 Sep 73, 21p FHWA-SD-EIS-73-5-D ELR-73-1539
Prepared by South Dakota State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*South Dakota, Environmental impact statements), Construction, Interchanges, Eminent domain.
Identifiers: Minnehaha County(South Dakota).

The project proposes construction of approximately 1.5 miles of highway in Sioux Falls, South Dakota (Minnehaha County). Eight homes will be removed in order to construct the interchange and two liquor establishments will be acquired. The natural environment will be only minimally affected.

EIS-TN-73-1604-F/GA PC$5.75/MF$1.45
Federal Highway Administration, Nashville, Tenn. Tennessee Div.
STATE ROUTE 63, SCOTT AND CAMPBELL COUNTIES, FROM HUNTSVILLE TO NEAR PIONEER TENNESSEE.
Final environmental impact statement.
10 Oct 73, 74p FHWA-TN-EIS-72-15-F ELR-73-1604
Supersedes report dated Jan 73, EIS-TN-73-0129-D. Prepared by State of Tennessee Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Tennessee, Environmental impact statements), Construction, Rural areas, Interstate highway transportation, Eminent domain.
Identifiers: Tennessee route 63, Campbell County(Tennessee), Scott County(Tennessee).

The proposed project is an improvement of the State Route 63 highway link between Huntsville and Pioneer. This is part of a program to improve State Route 63 between State Route 29 and Interstate 75. Project length ranges from 12.7 to 13.0 miles, depending on which alternate alignment is chosen. The project would have two traffic lanes throughout its entire length and an additional truck climbing lane where needed. The project is located in the central and eastern portions of Scott County and the western edge of Campbell County. Residential, industrial, and commercial growth will tend toward more concentration near the new facility. Areas of particular growth potential exist near the eastern limits of Huntsville, at Capitol Hill, Fairview, and Straight Fork. The adverse impacts which will be present are relocation of families and businesses, and a loss of wildlife habitat for both small and big game of between 72 and 121 acres, depending upon which alternate is chosen. Also, there will be the loss of some 18 to 22 acres of productive agricultural land.

EIS-TX-73-1562-D/GA PC$4.00
Soil Conservation Service, Washington, D.C.
LEONA RIVER WATERSHED, UVALDE COUNTY, TEXAS.
Draft environmental impact statement.
28 Sep 73, 37p USDA-SCS-ES-WS(Adm)-74-13-D ELR-73-1562

Descriptors: (*Environmental impact statements, *Watersheds), (*Texas, Environmental impact statements), Protection, Flood control, Flood plains, Vegetation.
Identifiers: Uvalde County(Texas).

The plan proposes that adequate land treatment be accomplished on about 39,180 acres, four single-purpose floodwater retarding structures be constructed, and provides for channel work on 3.47 miles of stream channel during a five-year installation period for the purpose of watershed protection and flood prevention. Habitability and use of flood plain areas will become more desirable through the reduction of flooding and attendant damages and inconveniences. Sediment and erosion damages to flood plain lands will be reduced. Recharge of vital ground water will be increased by approximately 2,200 acre-feet annually. Floodwater retarding structures will require 1,630 acres and channel work will require 300 acres for construction and maintenance. Vegetative cover on 123 acres needed for dams and emergency spillways will be destroyed, and cover on 239 acres required for sediment pools will be altered. All land areas needed for channel work will be revegetated immediately after construction with native and introduced grasses.

EIS-TX-73-1573-D/GA PC$14.00
Environmental Protection Agency, Dallas, Tex. Office of Grants Coordination.
CONSTRUCTION OF WASTEWATER FACILITIES, KERRYVILLE, TEXAS.
Draft environmental impact statement.
2 Oct 73, 236p Impact Statement-7310 ELR-73-1573

Descriptors: (*Environmental impact statements, *Water treatment), (*Texas, Environmental impact statements), Waste water, Facilities, Upgrading, Expansion, Construction, Regional planning, Activated sludge process, Filtration.

The city of Kerrville, proposes to upgrade and expand a present 1.0 mgd trickling filter facility to 2.25 mgd with a new activated sludge facility, some new interceptor mains, and modification to existing lift stations. Any adverse environmental effects resulting from the project are minor and mainly relate to construction.

EIS-UT-73-1584-D/GA PC$4.75
Zion National Park, Springdale, Utah.
PROPOSED ZION WILDERNESS, ZION NATIONAL PARK, UTAH.
Draft environmental impact statement.
3 Oct 73, 54p ELR-73-1584, DES-73-60

Descriptors: (*Environmental impact statements, *National parks), (*Utah, Environmental impact statements), Wildlife, Regulations, Management.
Identifiers: Zion National Park.

The National Park Service proposes that 119,200 acres of Zion National Park be designated as wilderness. The proposal also recommends 13,540 acres as potential wilderness addition to be designated as wilderness by the Secretary of the Interior when he determines that the lands are qualified. Environmental impacts discussed include ecological, social, and economic considerations. Some of the adverse effects are: possible rationed use, restrictions on backcountry facility development, shifting mass recreational needs to other areas, increased cost of trail maintenance, prohibition of certain research projects, and restricted resource management practices.

EIS-WA-73-1577-D/GA PC$4.75
Forest Service, Portland, Oreg. Pacific Northwest Region.
LAKE QUINAULT SEWAGE COLLECTION AND TREATMENT FACILITY.
Draft environmental impact statement.
2 Oct 73, 53p USDA-FS-DES(Adm)-74-32 ELR-73-1577

Descriptors: (*Environmental impact statements, *Sewage treatment), (*Washington(State), Environmental impact statements), Olympic National Forest, Lake Quinault, Sewers, Land use.
Identifiers: Grays Harbor County(Washington).

The Olympic National Forest management proposes to construct a sewage collection and treatment facility to abate pollution emanating from Forest Service facilities on the South Shore of Lake Quinault. The entire project is in Grays Harbor County, Washington. The treatment plant and drainfield site proposed would occupy approximately 5.5 acres of land within the boundary of the approximately 8,900 acre South Quinault Ridge roadless area. Short term effects are the normal disturbance associated with ditching, placing and backfilling sewer lines. These are considered nominal. Long term effects include continuation of present Forest Service administration and recreational facilities in their present location. The sewage treatment plant and drainfield would permanently reduce the area of the South Quinault Ridge roadless area by 5.5 acres. The area occupied would be modified to the extent that it would not be considered for wilderness classification.

ESTR-1-72/GA PC$6.00/MF$1.45
Eg and G, Woods Hole, Mass. (Usa). Environmental Equipment Div.
BACKGROUND REPORT AND BIBLIOGRAPHY FOR A STUDY TO FORECAST NUCLEAR POWER PLANT EFFECTS ON COASTAL ZONES.
Sep 72, 79p

Descriptors: (*Nuclear power plants, *Environmental engineering), (*Gulf of maine, *Oceanography), Bibliographies, Biology, Coastal waters, Geology, Meteorology, Seawater, Shores, Site selection, Thermal pollution, Waste heat, Water cooled reactors.

For abstract, see NSA 28 02, number 02610.

N73-28595/9GA PC$9.50/MF$1.45
Public Technology, Inc., Washington, D.C.
DEVELOPMENT AND EVALUATION OF THERMOPLASTIC STREET MAINTENANCE MATERIAL.
Final Report, 12 Feb. - 11 Jul. 1973.
W. D. Siemens. 11 Jul 73, 149p NASA-CR-133549
Contract NASW-2388

Descriptors: *Maintenance, *Pavements, *Streets, Asphalt, Cost analysis, Thermoplastic resins.

For abstract, see STAR 1119

ORNL-EIS-73-17/GA PC$24.25/MF$1.45
Oak Ridge National Lab., Tenn.
CADMIUM IN THE ENVIRONMENT: AN ANNOTATED BIBLIOGRAPHY.
E. D. Copenhaver, G. U. Ulrikson, L. T. Newman, and W. Fulkerson. Apr 73, 444p
Contract W-7405-eng-26

Descriptors: (*Cadmium, *Bibliographies), (*Environment, *Pollution), Air, Animals, Man, Mining, Monitoring, Plants, Reviews, Toxicity, Waste disposal, Water.

For abstract, see NSA 28 02, number 02642.

ORNL-EIS-73-60(Vol.1)(No.1)/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
NSF-RANN TRACE CONTAMINANTS ABSTRACTS.
E. D. Copenhaver. Jun 73, 38p
Contract W-7405-eng-26

Descriptors: (*Air pollution, *Bibliographies), (*Land pollution, Bibliographies), (*Water pollu-

tion, Bibliographies), Animals, Ecosystems, Elements, Environment, Metals, Nonradioactive waste disposal, Plants, Toxicity, Trace amounts.

For abstract, see NSA 28 03, number 07752.

PAT-APPL-148 132/GA PC$3.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
IMPROVED PROCESS FOR TREATMENT OF AQUEOUS SUSPENSIONS.
Patent Application,
Kurt A. Kraus. Filed 28 May 71, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Patent applications, *Filtration), (*Sewage treatment, Sewage filtration), Slurries, Desalting, Activated carbon treatment, Turbulent flow.
Identifiers: PAT-CL-210-23.

The patent application describes a method of treating aqueous waste streams for the purpose of removing a soluble or dispersed moiety which comprises passing said stream through a vertically disposed, porous, permeable material which contains a zone of fluidization and a solid fluidizing medium in said zine at a velocity sufficient to affect transpiration of a purified water product through said material. A major application for this invention lies in the treatment of aqueous sewage effluents.

PATENT-3 698 331/GA Not available NTIS
Office of the Secretary of the Army Washington D C
APPARATUS AND METHOD FOR THE DISPOSAL OF LIQUID WASTE MATERIAL.
Patent,
Alton J. Rohr, and Cornelius J. McKeown. Filed 19 Jul 71, patented 17 Oct 72, 6p Rept nos. PAT-APPL-163 794,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Sanitary engineering, *Incinerators), (*Patents, Sanitary engineering), Combustion, Wastes(Sanitary engineering).
Identifiers: *Liquid waste disposal, Urine.

The invention relates to an incinerator and a method for the disposal of liquid waste material of the type which contains a substantial amount of water. More particularly the invention relates to a method for the sanitary and relatively odorless disposal of urine and to an incinerator for evaporating the water and burning the combustible organic matter therein.

PB-223 326/0GA PC$2.85/MF$1.45
Council on Environmental Quality, Washington, D.C.
ENERGY AND THE ENVIRONMENT - ELECTRIC POWER.
Aug 73, 66p*
Paper copy also available from GPO $0.85 as stock no. 4111-00019.

Descriptors: (*Energy, *Pollution), (*Electric power generation, Pollution), Air pollution, Water pollution, Fuel consumption, Supply(Economics), Demand(Economics), Solid waste disposal, Government policies, Trends, Substitutes.
Identifiers: *Energy management, Quality of life.

The conflict between energy needs and the environment poses a problem that must be solved by understanding the factors that influence demands for energy and by developing energy systems that meet these demands with minimal damage to the environment. This report considers the elements underlying our growing demand for energy and the environmental implications of the complex energy systems for meeting this demand. It focuses on electric energy because of the particularly rapid growth in this sector.

PB-223 342/7GA PC$7.25/MF$1.45
Jefferson Parish Dept. of Sanitation, Metairie, La.
INSTREAM AERATION TO CONTROL DISSOLVED SULFIDES IN SANITARY SEWERS,
Ray L. Condon, Jr., R. A. Cooper, Jr., and A. J. Englande, Jr. Sep 73, 101p EPA-670/2-73-024, W73-14220
Grant FWPCA-WPRD-121-01-68
Prepared in cooperation with de Laureal Engineers, Inc.

Descriptors: (*Sewers, *Aeration), (*Aerators, Sewers), (*Hydrogen sulfide, Sewers), Performance evaluation, Odor control.

The research concerns the evaluation of the effectiveness of various full scale methods of in-sewer aeration for reducing hydrogen sulfide problems and to develop design data for future designs. Facilities constructed and evaluated included two aspirated air U-tube systems for force main discharges, one in-line Venturi aspirator and one in-line Vortex-Shear aerator in a force main and one eductor or air-lift pump installed in a gravity sewer.

PB-223 344/3GA PC$3.00/MF$1.45
Urban Mass Transportation Administration, Washington, D.C.
NEW SYSTEMS REQUIREMENTS ANALYSIS PROGRAM. A PROCEDURE FOR LONG RANGE TRANSPORTATION (SKETCH) PLANNING.
Technical rept.
Jul 73, 41p* UMTA-URD-44-73-3

Descriptors: (*Urban transportation, Computer programming), (*Mass transportation, *Urban planning), Design, Flow charting, Systems analysis, Time sharing, Networks, Cost estimates, Management planning, Evaluation, Algorithms.

The paper provides an overview of the entire UTPS (Urban Transportation Planning System) package and its development plan. It contains a detailed description of the sketch planning procedure as well as other UTPS modules used with the procedure designed to aid planners at all levels of transportation planning. The goal of sketch planning is to overcome the traditional problems of high cost in specifying and evaluating planning alternatives, and the inability to consider all modes simultaneously. The procedure provides an efficient means of describing and analyzing many alternative transportation networks, each composed of a large variety of modes, at a level of data aggregation appropriate to long range planning and to required policy decisions. Among the procedure's unique characteristics are the ability to consider scores of network alternatives expressed as a basic network with appended tree-structured set of modifications, its algorithm for finding multiple paths through a multi-modal network, and its estimation of travel demand using a multi-modal model. The procedure will provide for interactive operation using a time-shared computer and on-line graphics for phased network modification and evaluation. Initial modules of the procedure will be made available to the public in fall 1973.

PB-223 350/0GA PC$10.50/MF$1.45
Washington State Dept. of Ecology, Olympia.
A SELECTED ANNOTATED BIBLIOGRAPHY ON WATER RESOURCES OF THE STATE OF WASHINGTON.
1973, 553p* W73-14201, WRIS-Info-Bull-7
See also PB-223 351.

Descriptors: (*Water resources, *Bibliographies), (*Washington(State), Water resources), Columbia River, Snake River, Algae, Radioactivity, Water pollution, Limnology, Hydrology, Ecology, Industrial wastes, Waste disposal, Water quality, Water rights, Water treatment, Water supply, Abstracts.
Identifiers: Thermal pollution.

The bibliography, containing 340 abstracts was produced by the Water Resources Scientific Information Center from its information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). At the time of search for this bibliography, the data base had 50,631 abstracts covering SWRA through December, 1972 (Volume 5, Number 24). Author and subject indexes are included.

PB-223 351/8GA PC$7.75/MF$1.45
Washington State Dept. of Ecology, Olympia.
A SELECTED ANNOTATED BIBLIOGRAPHY ON COLUMBIA AND SNAKE RIVERS.
1973, 362p* W73-14202, WRIS-Info-Bull-6
See also PB-223 350.

Descriptors: (*Columbia River, *Bibliographies), (*Snake River, Bibliographies), (*Washington(State), Water resources), Stream flow, Estuaries, Radioactivity, Water pollution, Effluents, Fishes, Shellfish, Water quality, Aquatic biology, Hydrogeology, Reservoirs, Abstracts, Oregon, Idaho.
Identifiers: Thermal pollution.

The bibliography, containing 238 abstracts, was produced by the Water Resources Scientific Information Center from its information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). At the time of search for this bibliography, the data base had 50,631 abstracts covering SWRA through December 1972 (Volume 5, Number 24). Author and subject indexes are included.

PB-223 440/9GA PC$18.25/MF$1.45
Texas Univ., Austin. Center for Highway Research.
A DISCRETE-ELEMENT METHOD FOR TRANSVERSE VIBRATIONS OF BEAM-COLUMNS RESTING ON LINEARLY ELASTIC OR INELASTIC SUPPORTS.
Research rept.,
Jack Hsaio-Chieh Chan, and Hudson Matlock. Jun 72, 223p CFHR-3-5-63-56-24
Prepared in cooperation with the Texas Highway Dept., Austin.

Descriptors: (*Columns(Supports), Supports), Numerical analysis, Dynamic structural analysis, Random vibration, Elastic properties.

A discrete-element method of analysis for transverse vibration of beam columns resting on linearly or nonlinearly-elastic, or nonlinearly-inelastic, supports is presented. The applied forces include static fixed loads and time-dependent dynamic loads. The program is an extension of programs BMCOL 43 to cover inelastic supports and time-dependent axial thrusts. Two multi-element models are used to simulate the inelastic characteristics of supports, one which allows the beam to lift off the support when it deflects, upward or downward, and the other which considers the resistance to either upward or downward deflection. An internal damping factor, which is related to the first derivative with respect to time of the curvature of the beam, has been included, in addition to the conventional external viscous damping factor. The method is based on an implicit difference formulation of the Crank-Nicolson type. A computer program has been written to check the validities of the proposed multi-element models of tracing the loading paths of the nonlinearly-inelastic supports and of the implicit formulation of the Crank-Nicolson type. The results compare well with the theoretical results and with experimental data. (Author)

PB-223 508/3GA PC$4.75/MF$1.45
Massachusetts Univ., Amherst. Dept. of Plant and Soils Science.
THE USE OF ADAPTABLE PLANT SPECIES FOR ROADSIDE COVER IN MASSACHUSETTS.
Final rept.,

John M. Zak, Joseph Troll, John R. Havis, Hrant M. Yegian, and Peter A. Kaskeski. Feb 72, 162p* Roadside Development-23
Prepared in cooperation with Federal Highway Administration, Washington, D.C.

Descriptors: (*Highway planning, Landscaping), (*Plants(Botany), Highway planning), Plant growth, Maintenance, Grasses, Ornamental trees, Shrubs, Viability, Trees(Plants), Ferns, Mulches, Fertilizers, Massachusetts.
Identifiers: Roadside vegetation.

Direct seedings of woody perennials under a wood chip mulch and with nurse grasses, which act as a living mulch, have been made on roadside slopes to determine the feasibility of establishing woody species from seed. Seed dormancy studies were conducted on the species used. Planting root cutting, of sweet fern and bristly locust for establishment on roadsides has also been investigated. Requirements for the establishment and growth of crownvetch, milkvetch, and flat pea have been investigated in the greenhouse and in the highway districts of the State. These species can be successfully seeded and planted for roadside cover. A breeding program to select a short, vigorous form of Kentucky-31 tall fescue which would require little or no maintenance was started with seeds subjected to irradiation. Various methods of planting and treating rooted cuttings, bare-root seedlings, small and liner-size plants, and container-grown plants have been studied to determine best size, time of planting, handling, and care for survival and economy. A growth retardant, Maintain 21, was tested and found satisfactory for control of growth in grasses. Soil sterilants were also investigated for use in controlling grasses and weeds along fences and guard rails.

PB-223 534/9GA PC-GPO/MF$1.45-NTIS
Marquette Univ., Milwaukee, Wis. Dept. of Civil Engineering.
PHOSPHORUS REMOVAL BY TRICKLING FILTER SLIMES.
Environmental protection technology series,
A. E. Zanoni. Jul 73, 132p W73-14372, EPA-R2-73-279
Paper copy available from GPO $2.10 as EPI.23/2:73-279.

Descriptors: (*Phosphorus inorganic compounds, *Trickling filtration), (*Water treatment, Phosphorus inorganic compounds), (*Sewage treatment, Trickling filtration), Performance evaluation, Laboratory equipment, Nutrients, Phosphates, Nitrates, Slime.
Identifiers: Biological industrial waste treatment.

In an attempt to study phosphorus uptake by biological slimes, a variable speed rotating disc apparatus was constructed. Correlations were attempted between mineral composition of the feed solutions and the phosphorus and nitrogen content of the resulting slimes grown on the discs. An inclined channel apparatus was also constructed and evaluated to differentiate physical or chemical mechanisms from biological mechanisms of phosphorus uptake. The angle of inclination was used to measure the kinetic rates before and after inactivation of the biological slime with ultraviolet light. With the disc apparatus, limited success of inducing biological uptake of phosphorus was obtained. Results from the inclined plane growth chamber showed that the limited phosphorus uptake that did occur could be related to metabolic activity rather than physical sorption or chemical precipitation.

PB-223 535/6GA PC-GPO/MF$1.45-NTIS
Cedar Rapids Water Pollution Control Plant, Iowa.
PRESSURE FILTRATION OF WASTE WATER SLUDGE WITH ASH FILTER AID.
Environmental protection technology series,
James W. Gerlich, and M. Daniel Rockwell. Jun 73, 159p W73-14374, EPA-R2-73-231
Prepared in cooperation with Howard R. Green Co., Cedar Rapids, Iowa.
Paper copy available from GPO $2.10 as EP1.23/2:73-231.

Descriptors: (*Sludge, *Pressure filtration), (*Sewage treatment, *Sludge disposal), (*Filter aids, Sludge disposal), Sludge drying, Performance evaluation, Pilot plants, Dewatering, Fly ash, Cost estimates, Capitalized costs, Operating costs, Design criteria, Vacuum filtration.
Identifiers: Water pollution control, Sludge treatment.

Cedar Rapids, Iowa used pilot plant studies as an effective approach to an economic solution to dewatering secondary digested sludge. After piloting several dewatering processes, the pressure filter system was selected and a full scale plant was constructed as the first major installation in the United States. Performance data from the full scale plant was evaluated over a period of approximately nine months. This data indicates that the full scale plant is capable of operation at a greater capacity and efficiency than that projected from pilot plant data. Both fly ash and sludge ash were evaluated as a filter aid, with and without chemicals. Economic evaluations were made of operation and equipment. (Modified author abstract)

PB-223 541/4GA PC$7.50/MF$1.45
Palm Beach County Area Planning Board, West Palm Beach, Fla.
STATISTICAL DATA: PALM BEACH COUNTY, FLORIDA.
Jun 73, 106p PS-1

Descriptors: (*Urban areas, Florida), (*Florida, Statistical data), Residential buildings, Construction, Economic analysis, Populations, Traffic, Rural urban fringe, Indexes(Ratios), Census, Municipalities, Forecasting.
Identifiers: Standard metropolitan statistical areas, West Palm Beach(Florida), Building permits.

The report is a compilation of statistical information on the West Palm Beach area completed during a 1972 - 73 work program. The five major sections of the report are residential building permits, economic index data, population estimates and population projections, WPBUATS average daily traffic volumes (24 hour), and 1970 census of population and housing data for Palm Beach County and selected municipalities.

PB-223 558/8GA PC$2.75/MF$1.45
Tennessee Univ., Knoxville. Water Resources Research Center.
STRIP-MINED WATERSHED HYDROLOGIC DATA ACQUISITION STUDY.
Research rept.,
Bruce A. Tschantz. 27 Aug 73, 24p 35 W73-14368, OWRR-A-030-Tenn(1)
Contract DI-14-31-0001-3843

Descriptors: (*Aerial photography, *Coal mines), (*Remote sensing, *Watersheds), Strip mining, Land reclamation, Data acquisition, Infrared photography, Tennessee.

Remotely-sensed aerial photography of two small strip-mined East Tennessee watersheds was used as a means for obtaining land-use information essential to econometric and hydrologic studies and for reclamation practice surveillance. 1:12,000 scale maps were produced for both watersheds from three color IR photographic flights. Other available high altitude photography and thermal imagery data were used to help map strip-mine disturbed areas. Excellent photographic coverage and quality permitted approximately 5,041 acres of watershed, representing 847 acres of disturbed bench, slope, and slide areas to be mapped for each mission at a cost of less than 10 cents/acre. The study demonstrated the usefulness of using low altitude IR photography for identifying, mapping, and measuring strip-mine disturbance areas. (Modified author abstract)

PB-223 564/6GA PC$9.00/MF$1.45
California Univ., Davis. Water Resources Center.
WATER RESOURCES CENTER (UNIVERSITY-WIDE) ANNUAL REPORT 1 JULY 1971 - 30 JUNE 1972,
J. Herbert Snyder. Jan 73, 140p 25 W73-14370, OWRR-A-999-CAL(7)

Descriptors: (*Water resources, Research), (*California, Water resources), Ecology, Water pollution, Liquids, Waste disposal, Desalting, Economic analysis, Water supply, Cooling, Water treatment, Groundwater, Hydrogeology, Salinity, Pumping, Universities, Reviews, Project planning.
Identifiers: Water reuse.

The annual activity of the sponsored research program of the Water Resources Center of the University of California is summarized. Summary reports of individual research projects are presented together with statement of publications available from each project. Projects covered include those financed by the State of California and by the Office of Water Resources Research of the U.S. Department of Interior under Title I of PL 88-379. Also included is a summary of the information dissemination program of the California Water Resources Center and other activities relevant to development of the overall program.

PB-223 567/9GA PC$6.50/MF$1.45
National Environmental Research Center, Cincinnati, Ohio. Office of Research and Development.
ACTIVE RESEARCH TASKS REPORT. A COMPILATION OF DESCRIPTIVE SUMMARIES OF INTRAMURAL AND EXTRAMURAL RESEARCH, DEVELOPMENT AND DEMONSTRATION TASKS.
Rept. for 1 Jul 72-30 Jun 73,
George R. Shultz, and Doris J. Harmon. 1973, 288p* EPA-670/9-73-056

Descriptors: (*Water pollution, *Research), Water analysis, Sewage treatment, Overflows, Industrial waste treatment, Mining, Water supply.
Identifiers: Oil pollution.

The report disseminates a total picture of the research programs conducted and supported by the National Environmental Research Center - Cincinnati, during Fiscal Year 1973. It is organized according to major research program elements, subdivided according to the Center's research objective achievement plans, and with each research objective achievement plan further subdivided into individual research tasks (or projects). This report reflects the closely related major and supportive research themes at the Center as they are being coordinated for a 'total environment' approach. It is believed that the information contained in the pages that follow, will be of benefit to all users. (Author)

PB-223 568/7GA PC$11.25/MF$1.45
Environmental Protection Agency, Washington, D.C. Office of Research and Monitoring.
A SURVEY OF EMISSIONS AND CONTROLS FOR HAZARDOUS AND OTHER POLLUTANTS.
Environmental monitoring series,
A. J. Goldberg. Feb 73, 185p EPA-R4-73-021

Descriptors: (*Air pollution, *Industrial wastes), Surveys, Sources, Arsenic, Asbestos, Barium, Beryllium, Boron, Cadmium, Chlorine, Copper, Fluorides, Lead(Metal), Manganese, Mercury(Metal), Nickel, Selenium, Tin, Vanadium, Zinc, Food industry, Chemical industry, Metal industry, Paper industry, Economic surveys, Particles, Odors, Tables(Data).
Identifiers: *Air pollution abatement, Air pollution control, Cement industry.

A preliminary analysis was undertaken to prepare a control technology development plan for air pollution problems facing industry. A literature search was completed (with 144 references) to estimate toxicity levels of 18 pollutants, and the

magnitude of emissions from industrial emitter types or classes of emitting processes. A review of control methods organized by pollutants as well as industry, offensive trades (animal processing), food industry (brewery and cannery), chemical industry (paint and rubber), metal industry (foundry and metal coating), other (paper textile, cement, etc.) is included. Minimum controls were often reported where sites were remote to populated areas. Emission hazard data is presented in 14 tables and appendices. Flow charts indicate emission allocations in major areas of processing. Identification and emission points are shown for principal emitting processes. The survey recommends that new R and D should focus on control of non-ferrous emitters, heat and energy generating sources, open mining milling and materials handling as well as several lesser industrial sources, particularly those emitting large amounts of fine particulate material, (less than 2 micron diameter particles). (Modified author abstract)

PB-223 589/3GA PC$5.50/MF$1.45
Copley International Corp., La Jolla, Calif.
A STUDY OF THE SOCIAL AND ECONOMIC IMPACT OF ODORS. PHASE III. DEVELOPMENT AND EVALUATION OF A MODEL ODOR CONTROL ORDINANCE.
Final rept.
Feb 73, 219p* EPA-650/5-73-001
Contract EPA-68-02-0095

Descriptors: (*Odor control, *Legislation), (*Air pollution, Odor control), Ordinances, Law enforcement, Attitude surveys, State government, Communities, Public opinion.

The aim of the research was the preparation of a model odor control ordinance that could be adopted and applied effectively by enforcement authorities throughout the United States. To meet this objective the following tasks were undertaken: Preparation of a tentative form of a model ordinance; Selection of four air pollution control agencies to evaluate the procedures developed in the second phase of research along with the model ordinance; Instruction of employees of the selected agencies in the proper use of the procedures in relation to the model ordinance; Guidance of selected agencies' project related field activities; and Refinement of the procedures and the model ordinance for submission to the Environmental Protection Agency. It is concluded that a model ordinance cannot be drafted that is compatible with the legalistic approach to controlling air pollution preferred by every jurisdiction. Thus, emphasis in the development of the recommended form of the model ordinance was given to a conceptual framework that would promote the most efficient solutions to community odor problems given the existing state of knowledge.

PB-223 591/9GA PC$3.00/MF$1.45
National Environmental Research Center, Cincinnati, Ohio. Technical Information Office.
ENVIRONMENTAL RESEARCH PUBLICATIONS, JANUARY 1971-JULY 1973.
5 Jul 73, 40p* EPA-670/9-73-004

Descriptors: (*Water pollution, *Bibliographies), (*Sewage treatment, Bibliographies), (*Industrial waste treatment, Bibliographies), Air pollution, Solid waste disposal, Radioactive wastes.
Identifiers: *Water pollution control, Oil pollution.

This List of Publications has been created to announce reports and publications of the U.S. Environmental Protection Agency's National Environmental Research Center, Cincinnati (NERC). This literature reports on results of scientific and engineering studies on pollution control technology performed by intramural activities of the NERC-Cincinnati laboratories or by cooperative activities with research and industrial organizations through contracts and grants. This publication is not intended to be a complete reference of all the technical publications of the U. S. Environmental Protection Agency. Rather, it is a selected list of those publications from the National Environmental Research Center in Cincinnati.

PB-223 600/8GA PC$10.25/MF$1.45
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR QUALITY DATA DIRECTORY OF AIR QUALITY MONITORING SITES, 1971.
Apr 72, 161p APTD-0979

Descriptors: (*Air pollution, Sampling), Sites, Tables(Data), Directories, Urban areas.
Identifiers: Air quality data.

The Environmental Protection Agency (EPA) operates the National Aerometric Data Bank for storage and retrieval of aerometric data collected by local, state, and Federal air pollution control agencies. Also included in the Bank is a limited amount of data collected by private agencies. This directory lists those monitoring sites that collected the aerometric data stored in the Bank. Those monitoring sites listed with a Federal surveillance system between January 1957 and June 1971 are included. Each site is identified by state, city, county, parish, or planning district; and the particular sampling site within the city, county, parish, or planning district. The type of agency sampling at that site and the type of project being conducted at the site are also denoted.

PB-223 622/2GA PC$11.00/MF$1.45
Colorado State Univ., Fort Collins.
IMPACT ON MAN OF ENVIRONMENTAL CONTAMINATION CAUSED BY LEAD.
Progress rept. 1 Jul 70-30 Jun 71,
H. W. Edwards, M. L. Corrin, L. O. Grant, L. M. Hartman, and E. R. Reiter. Jul 71, 180p NSF-RA/E-72-003
Grant NSF-GI-4
See also PB-223 623.

Descriptors: (*Lead(Metal), *Pollution), (*Air pollution, Lead(Metal)), Exhaust gases, Fuel additives, Accumulation, Residues, Soil chemistry, Leaching, Gas analysis, Chemical reactions, Tissues(Biology), Weather modification, Nucleation, Plants(Botany), Economic factors, Lead inorganic compounds, Lead organic compounds, Automotive fuels.
Identifiers: *Automobile exhaust, Path of pollutants, Economic impact.

The objectives of the research was to develop and test an interdisciplinary approach to environmental problems using lead as an example, and to evaluate consequences of lead pollution from traffic exhaust and economic and technological effects of steps taken to reduce lead pollution from this source. Emphasis during the phase of the program covered in this report is upon pilot experiments to determine where, in what forms, and at what rate lead from traffic exhaust is accumulating in the environment. The topics covered include atmospheric transport, atmospheric chemistry, inadvertent weather modification, bioaccumulation, lead in soil and plants, economic aspects, and chemical analysis. (Modified author abstract)

PB-223 623/0GA PC$14.75/MF$1.45
Colorado State Univ., Fort Collins.
IMPACT ON MAN OF ENVIRONMENTAL CONTAMINATION CAUSED BY LEAD.
Interim rept. 1 Jul 71-30 Jun 72,
H. W. Edwards, M. L. Corrin, L. O. Grant, L. M. Hartman, and P. C. Katen. Jul 72, 252p NSF-RA/E-72-004
Grants NSF-GI-4, NSF-GI-34813
See also PB-223 622.

Descriptors: (*Lead(Metal), *Pollution), (*Air pollution, Lead(Metal)), Exhaust gases, Fuel additives, Automotive fuels, Accumulation, Residues, Tissues(Biology), Soil chemistry, Plants(Biology), Leaching, Gas analysis, Chemical reactions, Weather modification, Nucleation, Economic factors, Lead inorganic compounds, Lead organic compounds.
Identifiers: *Automobile exhaust, Path of pollutants, Economic impact.

The research program deals with environmental effects of lead pollution and consequences of those effects for man. The objectives were to evaluate the nature, extent, and effects of environmental pollution by automotive lead; and to provide a model case study of an environmental pollution problem with a significant component. The report describes research progress realized during the second year of the program. It expands on the results discussed in the previous year as described in PB-223 622. (Modified author abstract)

PB-223 625/5GA PC$3.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. of Animal Science.
UTILIZATION OF FIBROUS WASTES AS SOURCES OF NUTRIENTS.
Final rept.,
J. M. Leatherwood. 1973, 16p EPA-670/2-73-090
Grant EP-00274

Descriptors: (*Cellulose, *Biodeterioration), (*Animal nutrition, Cellulose), (*Feeding stuffs Cellulose), Enzymes, Bacteria, Anaerobic processes, Fermentation, Fungi, Newsprint, Materials recovery, Hydrolysis, Solid waste disposal.
Identifiers: *Waste recycling.

The purpose of this study was to develop a biological system for conversion of natural cellulosic wastes to products that can be utilized as nutrients by animals. Efforts toward development of a fermenter for the growth of an anaerobic cellulolytic bacteria on cellulosic materials were not successful because the yield of bacterial cells and other products was too low. However, a repression mechanism was demonstrated on the synthesis of cellulose that prevents accumulation of sugar from the hydrolysis of cellulose. The strictly anaerobic bacteria Ruminococcus albus was successfully grown on petri plates. Trichoderma viride cultures also were used in laboratory experiments for degradation of cellulose.

PB-223 630/5GA PC$3.75/MF$1.45
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air and Water Programs.
AIR QUALITY DATA FOR NONMETALLIC INORGANIC IONS 1969 AND 1970 FROM THE NATIONAL AIR SURVEILLANCE NETWORKS.
Jun 73, 80p APTD-1466

Descriptors: (*Air pollution, *Inorganic compounds), Ammonium compounds, Fluorides, Inorganic nitrates, Sulfates, Tables(Data), Particles.
Identifiers: *Air quality data, National Air Surveillance Networks.

Particulate pollutant data gathered during 1969 and 1970 by the cooperating stations of the National Air Surveillance Networks provide the basis for listing the urban and nonurban concentrations of four nonmetallic inorganic ions, ammonium, fluoride, nitrate, and sulfate. Laboratory methodology for each nonmetallic inorganic constituent is described. The data for ammonium, nitrate, and sulfate are presented as cumulative frequency distributions. (Author)

PB-223 636/2GA PC$7.75/MF$1.45
Texas Univ., Austin. Center for Highway Research.
EVALUATION AND REVISION OF TEXAS HIGHWAY DEPARTMENT RIGID PAVEMENT DESIGN PROCEDURE.
Research rept. (Final), Sep 70-Aug 71,

B. Frank McCullough, Harvey J. Treybig, and Ramesh K. Kher. Nov 72, 114p CFHR-3-8-71-502-1F

Descriptors: (*Concrete pavements, Design standards), Concrete construction, Pavement bases, Portland cements, Reinforcing steels, Subgrades, Design criteria, Texas.

Recent experiences with the performance of concrete pavements in Texas have been of major concern to design engineers, who have pointed out that greater thicknesses of pavements than those predicted by the current design manual should be used. The report revises the current design manual and presents a new procedure for the design of portland cement concrete pavements. The procedure is based on information obtained from various research projects of the Texas Highway Department as well as the experience and ideas of THD design personnel. The report summarized the findings that may be implemented immediately by the Texas Highway Department. The draft of recommended revisions and design details has been prepared in a form in which they can be included in the design manual with a minimum of effort. The recommended revisions provide an incremental step towards use of the Rigid Pavement System (RPS), developed for the Texas Highway Department under Project 1-8-69-123, since these revisions contain many of the concepts that are used in RPS. (Author)

PB-223 638/8GA PC$5.25/MF$1.45
Human Resources Research Organization, Alexandria, Va.
PUBLIC ATTITUDES TOWARD HAZARDOUS WASTE DISPOSAL FACILITIES.
Final rept.,
L. L. Lackey, T. O. Jacobs, and S. R. Stewart. Sep 73, 181p* EPA-670/2-73-086
Contract EPA-O 68-03-0156

Descriptors: (*Solid waste disposal, *Attitude surveys), (*Hazardous materials, Solid waste disposal), Public opinion, Questionnaires, Mass communication, Models, Human behavior, Strategy.

This project had three purposes: (a) survey public attitudes toward a proposed system of national disposal sites (NDS), (b) develop a behavioral model as a means of predicting citizens' reactions to an NDS in a particular location, and (c) propose an effective public information compaign. The national survey, sampling randomly and purposefully selected respondents (key influentials), was conducted in 10 counties that were selected as feasible NDS locations. The questionnaire elicited information about three classes of variables considered predictive of citizen reaction to an NDS. These variables, (a) contextural variables (physical/economic environment), (b) situational variables (Social environment), and (c) individual variables (personal attitudes/beliefs), constituted the basic structure of the behavioral model. A generalized public information program designed to create public acceptance of NDSs is outlined. (Modified author abstract) Portions of this document are not fully legible.

PB-223 647/9GA PC$3.75/MF$1.45
Bureau of Mines, Bartlesville, Okla. Bartlesville Energy Research Center.
CHARACTERISTICS AND PHOTOCHEMICAL REACTIVITY OF EMISSIONS.
Environmental protection technology series (Final),
B. Dimitriades, B. H. Eccleston, G. P. Strum, and C. J. Raible. Dec 72, 97p* EPA-R2-73-276
Contract EPA-IAG-0138(D)

Descriptors: (*Air pollution, Exhaust gases), (*Automotive fuels, *Exhaust gases), (*Diesel engines, *Odors), Automobile engines, Gas analysis, Chemical composition, Gasoline, Fuel additives, Oxidizers, Correlation, Photochemical reactions.

The report describes three separate projects which relate to the study of the characteristics of automobile exhaust emissions. Part I studied the association of automotive fuel composition with exhaust reactivity. This involved experimental tests with different automotive engines and with gasolines of varied composition. Fuel composition was determined by gas chromatography. Exhaust reactivity was both estimated from detailed composition data and determined directly using a smog chamber. Part II, Toxic Products from Fuel Additives, studied procedures for the determination of any toxic gaseous products resulting from thermochemical reactions of fuel additives in the combustion process. The exhaust analyses included determination of: hydrocarbon, oxygenates, and the additive and its direct combustion products. Part III, Diesel Odor, studied the following problems: development of an odorant dilution and presentation system suitable for use with isolated exhaust components and synthetic odorants, establishing methods for demonstrating the reactivity and stability of diesel exhaust odorants, and isolation and collection of unstable components.

PB-223 651/1GA PC$5.75/MF$1.45
Syracuse Univ. Research Corp., N.Y.
INCINERATION OF PLASTICS FOUND IN MUNICIPAL WASTES.
Final rept.,
R. W. Heimburg, A. R. Colella, D. Jones, J. H. Rausch, and M. Macrina. Sep 73, 246p* EPA-670/2-73-087
Grant EP-00304

Descriptors: (*Plastics, *Combustion), (*Solid waste disposal, Plastics), (*Incinerators, Plastics), Garbage, Fly ash, Air pollution, Combustion products, Polyethylene, Polystyrene, Polyvinyl chloride, Acrylonitrile copolymers, Polypropylene, Polycarbonate resins, Polyurethane resins, Urea formaldehyde resins, Melamines, Toxicology, Rats, Plants(Botany).

The purpose of this project was to determine the combustion efficiency of plastics when burned in several types of laboratory incinerators. These laboratory units were designed to simulate the primary flame zones of municipal incinerators. The parameters of efficiency considered were: Percent of material consumed, the chemical 'cleanliness' of the gaseous effluent, the rate of production of flyash, and the more obvious environmental effects of the gaseous effluent, flyash, and residue-ash. Several pure resins were burned individually in several laboratory incinerators. Also, several mixtures of plastics and a garbage recipe were burned. Results are presented here from analyses of the effluent along with the effects of each effluent on rats and plants for 1- to 8-hour exposures.

PB-223 652/9GA PC$4.50/MF$1.45
Davis (W. E.) and Associates, Leawood, Kans.
EMISSION STUDY OF INDUSTRIAL SOURCES OF LEAD AIR POLLUTANTS, 1970.
Final rept.,
W. E. Davis. Apr 73, 133p* APTD-1543
Contract EPA-68-02-0271

Descriptors: (*Air pollution, *Lead(Metal)), Sources, Inventories, Industrial wastes, Mining, Metal industry, Lead oxides.
Identifiers: Emission factors, Products.

Emission Study of Industrial Sources of Lead Air Pollutants has been prepared to provide reliable information regarding the nature, magnitude, and extent of lead emissions from industrial sources in the United States for the year 1970. Background information concerning the basic characteristics of the lead industry has been assembled and included. Brief process descriptions, limited to areas closely related to existing or potential atmospheric losses of lead, are included. Lead emissions and emission factors are presented. (Author)

PB-223 661/0GA PC$5.00/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
PAVEMENT DEFLECTION MEASUREMENTS AND THEIR APPLICATION TO STRUCTURAL MAINTENANCE AND OVERALL DESIGN,
P. J. Norman, R. A. Snowdon, and J. C. Jacobs. 1973, 57p TRLL-LR-571

Descriptors: (*Flexural pavements, Deflection), (*Roads, Dynamic structural analysis), Performance, Loads(Forces), Covering, Service life, Thickness, Measurement, Correlation techniques, Test equipment, Design, Forecasting, Great Britain, Maintenance.

The transient deflection of road pavements under the passage of a heavy wheel-load has been related, by studies on experimental and normal in-service roads, to the long-term performance of the pavements. This provides the engineer with a relatively simple method of forecasting the performance and future structural maintenance requirements for existing roads. This report, which does not discuss the research background to the work, is intended to present to the engineer the information he requires to make and interpret deflection measurements. The use of the Deflection Beam is described in detail, together with the procedure for correcting measured deflections to a standard temperature of 20C. As an alternative and more rapid means of measuring deflection, the Deflectograph and its method of operation are described. Curves to correlate deflection derived from the two methods are provided. Deflection criterion curves, which take into account the changes in deflection which occur with age, are presented and used to estimate the life expectancy of pavements being considered for structural maintenance. Finally curves are provided from which the reduction in deflection and extension of life likely to accrue from the use of different thicknesses of rolled asphalt overlay can be deduced.

PB-223 663/6GA PC$5.50/MF$1.45
Coastal Area Planning and Development Commission, Brunswick, Ga.
PROPOSED ZONING ORDINANCE FOR RICHMOND HILL, GEORGIA - 1973.
Final rept.
Apr 73, 68p RH-3
Sponsored in part by Department of Industry and Trade, Atlanta, Ga.

Descriptors: (*Urban planning, *Georgia), (*Land use zoning, Ordinances), Regulations, Sites, Boundaries, Residential buildings, Industrial buildings, Commercial buildings, Penalties, Law enforcement.
Identifiers: *Richmond Hill(Georgia).

A Zoning Ordinance is developed for the city of Richmond Hill, GA in regulating the height, size, use, and location of buildings; land for trade, industry, residence, and other purposes; creating districts for said purposes and establishing the boundaries thereof; defining certain terms used; providing for administration, enforcement and amendment; providing for penalties for the violation of the provisions of this ordinance; repealing conflicting ordinances and other purposes. . *

PB-223 674/3GA PC$3.00/MF$1.45
Coastal Area Planning and Development Commission, Brunswick, Ga.
EXISTING LAND USE SURVEY AND ANALYSIS FOR EFFINGHAM COUNTY, GEORGIA.
Final rept.
Apr 73, 13p Eff-Co-ELUSA-1
Sponsored in part by Department of Industry and Trade, Atlanta, Ga.

Descriptors: (*Regional planning, *Georgia), (*Land use, Regional planning), Population growth, Residential buildings, Agriculture, Industrial buildings, Commercial buildings, Public land, Forest land, Swamps.

Identifiers: *Effingham County(Georgia).

The Existing Land Use Survey and Analysis in text and map form documents the various land uses within Effingham County. The inventory will serve as a basis to perform the additional comprehensive planning requirements to continue the planning process.

PB-223 675/0GA PC$4.00/MF$1.45
Greenville County Planning Commission, S.C.
ANNEXATION-AN ALTERNATIVE FOR GROWTH, GREER, SOUTH CAROLINA.
Jun 73, 40p SC-40-0014-0668-73

Descriptors: (*Urban planning, *South Carolina), Boundaries, Trends, Public utilities, Population growth, Services, Ordinances, Regulations, Land use zoning.
Identifiers: *Greer(South Carolina).

The report constitutes the beginning stages of an urban growth plan for the city of Greer, S.C. By design, the initial emphasis concerns the feasibility of expanding the city's corporate limits through annexation. The ultimate goal, however, is a comprehensive plan for ordered growth that meshes all those tools available--annexation, taxation, extension of utilities, location of public facilities, subdivision regulations, and zoning--into a single guiding influence, a growth plan for the city of Greer. (Author)

PB-223 682/6GA PC$4.25/MF$1.45
Greenville County Planning Commission, S.C.
CAPITAL IMPROVEMENT PROGRAM, 1973-1978, MAULDIN, SOUTH CAROLINA.
Jun 73, 42p SC-40-0014-0671

Descriptors: (*Urban planning, *South Carolina), Policies, Financial management, Improvement, Budgeting, Land acquisition.
Identifiers: *Mauldin(South Carolina).

The report has been prepared for the city of Mauldin, S.C., in an effort to assist in programming both short- and long-range financial needs of the city. The capital improvement program attempts to relate all future public improvements and developments and land acquisitions by the city of Mauldin to planned objectives and development policies. This capital improvement program has been utilized as the basis for assisting in the preparation of a capital improvements budget through the identification of future public improvements in and around the municipality of Mauldin which are felt to be needed in order to meet the overall objectives of the community. (Author)

PB-223 690/9GA PC$4.25/MF$1.45
Lower Savannah Regional Planning and Development Council, Aiken, S.C.
PROPOSED SUBDIVISION REGULATIONS, BARNWELL, SOUTH CAROLINA.
Jul 73, 43p SC-40-0014-0684
Prepared in cooperation with Barnwell Planning and Zoning Commission.

Descriptors: (*Urban planning, *South Carolina), (*Land use zoning, Ordinances), Regulations, Standards, Boundaries, Streets, Public utilities, Services, Recreational facilities, Schools, Residential buildings, Sites, Public buildings, Public health.
Identifiers: *Barnwell(South Carolina).

These proposed subdivision regulations are intended to govern the subdivision of land in the city of Barnwell, S.C. They provide for the harmonious development of the city; for the coordination of streets within subdivisions with other existing or planned streets or official map streets; for the size of blocks and lots; for the dedication or reservation of land for streets, school sites and recreation areas and of easements for utilities and other public services and facilities; and for a distribution of population and traffic which will tend to create conditions favorable to health, safety, convenience, prosperity and general welfare. In addition, these regulations also prescribe that no subdivision plan will be approved unless all land intended for use as building sites can be used safely for building purposes, without danger from flood or other inundation or from other menaces to health, safety, or public welfare. (Author)

PB-223 691/7GA PC$3.00/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL RECONNAISSANCE SURVEY, PORT ROYAL, SOUTH CAROLINA.
1973, 17p SC-40-0014-0706
Prepared by Beaufort County Joint Planning Commission, S.C.

Descriptors: (*Urban planning, *South Carolina), Land use, Water supply, Sewage, Residential buildings, Police, Fire protection, Ordinances, Recreation, Recommendations.
Identifiers: *Port Royal(South Carolina).

The Initial Reconnaissance Survey for town of Port Royal was conducted in the Spring of 1973 by the Beaufort County Joint Planning Commission. The basic intent of the study was to analyze the key issue, opportunities, and development objectives in the community and evaluate the effectiveness of the town's comprehensive planning program as a vehicle for dealing with the present and future problems and prospects confronting the Town of Port Royal. As a result of this analysis, the report makes recommendations pertaining to the town's organization for planning, the quality and effectiveness of past planning efforts, and the type of planning work Port Royal should be engaged in during the coming years.

PB-223 692/5GA PC$4.50/MF$1.45
Greenville County Planning Commission, S.C.
CAPITAL IMPROVEMENT PROGRAM 1974-1978 GREER, SOUTH CAROLINA.
Jun 73, 47p SC-40-0014-0668-74

Descriptors: (*Urban planning, *South Carolina), Recommendations, Financial management, Budgeting, Revenue, Trends, Expenses, Taxes.
Identifiers: *Greer(South Carolina).

The report constitutes the first capital improvement program for the city of Greer, S.C. A schedule of proposed capital projects for the program period 1974-1978 and a brief analysis of the city's financial condition are included. The city's tax base, bonded indebtedness and operating budget have been examined, and a projection of revenues and expenditures, based on past trends, has been completed. (Author)

PB-223 693/3GA PC$10.30/MF$1.45
Environmental Protection Agency, Washington, D.C. Library Systems Branch.
EPA REPORTS BIBLIOGRAPHY: A LISTING OF EPA REPORTS AVAILABLE FROM THE NATIONAL TECHNICAL INFORMATION SERVICE AS OF APRIL 1, 1973.
Jul 73, 960p* EPA-LIB-73-01
Paper copy also available from GPO $7.30 as EP1.21:EN 8/5/973.

Descriptors: (*Pollution, *Bibliographies), (*Air pollution, Bibliographies), (*Water pollution, Bibliographies), (*Solid waste disposal, Bibliographies), Noise(Sound).
Identifiers: *Noise pollution.

The bibliography contains citations and abstracts for all U. S. Environmental Protection Agency and its predecessor agencies' reports contained in the NTIS collection as of April 1, 1973. Indexes to the citations include author, corporate source, subject, contract, and title.

PB-223 694/1GA PC$2.00/MF$1.45
Highway Research Board, Washington, D.C.
MOTORIST COMMUNICATIONS AND SERVICES,
Eugene F. Reilly, Richard L. Hollinger, Joseph Santacroce, Stanley Woolman, and Ivor S. Wisepart. 1973, 54p HRB-Record-450
Library of Congress catalog card no. 73-13459. International Standard book no. 0-309-02182-0.
Paper copy also available from Highway Research Board, 2101 Constitution Ave., N.W., Washington, D.C. 20418 $2.00.

Descriptors: (*Highways, Research), (*Medical services, Highways), Telephone systems, Freeways, Traffic safety.
Identifiers: Motorist aid systems, Highway emergency medical services.

The four papers discuss motorist aid systems and a transportation system for delivery of emergency medical care.

PB-223 698/2GA PC$2.40/MF$1.45
Highway Research Board, Washington, D.C.
TRANSIT PLANNING AND DEVELOPMENT,
John C. Rea, James H. Miller, N. Craig Miller, John C. Goodknight, and John B. Schnell. 1973, 80p HRB-Record-449
Library of Congress catalog card no. 73-13110. International Standard book no. 0-309-02180-4.
Paper copy also available from Highway Research Board, 2101 Constitution Ave., N.W., Washington, D.C. 20418 $2.40.

Descriptors: (*Highways, Research), (*Urban transportation, Planning), Buses(Vehicles), Parking facilities, Control, Mass transportation.

Seven research reports are presented on the planning and development of public transportation.

PB-223 703/0GA PC$5.25/MF$1.45
Faucett (Jack) Associates, Inc., Chevy Chase, Md.
USE OF PRODUCTIVITY MEASURES IN TRANSPORTATION POLICY MAKING AND REGULATION.
Final rept.,
Raymond C. Scheppach, L. Carl Woehlcke, and Jack G. Faucett. Jun 73, 182p JACKFAU-73-94-2
Contract DOT-OS-20227

Descriptors: (*Transportation, Productivity), (*Policies, Transportation), Organizations, Control, Rates(Costs), Salaries, Adjusting, Common carriers, Prices, Recommendations, Mergers, Acquisition, Reviews, Bargaining, Labor relations, Capital, Output.

The report describes how productivity measures can be effectively utilized as guides in transportation policy making and regulation. The two primary uses of productivity measures examined include rate adjustment analysis and the establishment of guidelines for wage increases. Since these two uses are central to the focus of the report, specific procedures are presented to assist in the application of productivity measures. A secondary use, the use of productivity measures as internal control tools by individual carriers, is also investigated. Other topics include the current state-of-the-art and the definitional and conceptual problems involved in quantifying the major components of productivity measurement. Portions of this document are not fully legible.

PB-223 704/8GA PC$4.25/MF$1.45
Greenville County Planning Commission, S.C.
RECREATION PLAN - GREER, SOUTH CAROLINA 1973-1990.
May 73, 42p SC-40-0014-0670

Descriptors: (*Urban planning, *South Carolina), (*Recreation, Urban planning), Parks, Inventories, Project planning, Recreational facilities, Budgeting, Recommendations.
Identifiers: *Greer(South Carolina).

The report represents a plan and program for parks, recreation, and open space facilities in Greer, S.C. The purpose of this study is to inventory and analyze park and recreational facilities, establish standards for a park and recreation system, determine city recreation needs, and develop a 1990 plan and program for the Greer park, recreation, and open space system. (Author)

PB-223 706/3GA PC$4.25/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT FOR MCCLELLANVILLE, SOUTH CAROLINA.
Jun 73, 45p SC-40-0014-0724
Prepared by Berkeley-Charleston-Dorchester Regional Planning Council, Charleston, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Residential buildings, Urban planning), Construction, Population growth, Recommendations, Project planning, Income, Renovating.
Identifiers: *McClellanville(South Carolina).

The report is the first housing study published for the McClellanville, S.C. area. It includes an analysis of the area's population; general economic situation; and housing inventory based upon existing conditions and building trends. The final section of the study outlines a housing program and objectives for McClellanville which encompasses recommendations for residential rehabilitation as well as preservation. (Author)

PB-223 707/1GA PC$11.25/MF$1.45
Texas Dept. of Community Affairs, Austin. Div. of Comprehensive Planning.
COMPREHENSIVE PLAN REPORT FOR THE CITY OF MCKINNEY, TEXAS.
Final rept.
Mar 73, 184p CPA-TX-06-16-1023
Prepared in cooperation with Marvin Springer and Associates, Dallas, Texas.

Descriptors: (*Urban planning, *Texas), Reviews, Population growth, Land use, Streets, Urban transportation, Schools, Parks, Community development, Public buildings, Central city, Pollution.
Identifiers: *McKinney(Texas).

The Comprehensive Plan Report for the City of McKinney, TX, and its contiguous planning area contains the composite summary of the various planning elements covered by interim study reports as part of an extensive planning program. The comprehensive plan is designed as a guide for the future physical development of the city and the planning area. The plan summarizes the basic data and proposals for each planning element including, population, land use, thoroughfares and transportation, schools, parks and open space structure, community facilities, public buildings, business district, plan implementation and environmental assessment. The interrelationship of the various elements in indicated and physically illustrated by the comprehensive plan map. The data, proposals and plans constituting the comprehensive plan are intended as a guide to the daily development and improvement decisions which city officials, developers and others must make concerning both interim and long-range development of the future McKinney.

PB-223 708/9GA PC$3.00/MF$1.45
Texas Transportation Inst., College Station.
ESTABLISHMENT AND MANAGEMENT OF ROADSIDE VEGETATION, 1971.
Interim rept. Sep 69-May 72,
Wayne G. McCully, and James L. Stubbendieck.
May 72, 19p TTI-2-18-69-142-3
Sponsored in part by Texas Highway Department, Austin, and Federal Highway Administration, Washington, D.C.

Descriptors: (*Highways, *Landscaping), (*Soil erosion, Control), Soil properties, Granulation, Clays, Soil texture, Polymers, Gypsum, Loams, Grasses, Calcium oxides, Acidity, Plants(Botany), Weed control, Herbicides.

Tests were installed in 1971 to modify roadside soil materials limiting plant growth and to develop chemical treatments for controlling unwanted vegetation. Plastic clays which show a poor tendency toward granulation can be modified by treatment with cationic polymers to favor vegetation establishment. Other treatments such as gypsum and certain soil amendments were not satisfactory. Plating with topsoil was very satisfactory, and better stands of grass were secured when topsoil was not mixed with the clay material. Treatment of extremely acid material with massive rates of lime is effective for at least three years. The acidity increases gradually over this time. Annual and some perennial plants can be selectively controlled in multiflora rose hedges, but most perennial weeds persist.

PB-223 711/3GA PC$5.50/MF$1.45
Oconee Area Planning and Development Commission, Oconee Area. Milledgeville, Ga.
AREAWIDE CODE ADMINISTRATION STUDY.
Final rept.
Jan 73, 66p OAPDC-73-02

Descriptors: (*Building codes, *Urban areas), (*Urban planning, Coding), Management, Reviews, Utilization, Feasibility, Urban renewal.
Identifiers: Jurisdictional codes, Housing codes, Plumbing codes, Electrical codes, Milledgeville(Georgia).

An analysis is made of the utilization and administration of municipal codes in Milledgeville, Ga. (housing, building, plumbing, electrical, etc.), and the feasibility of using jurisdictional codes for area activity.

PB-223 712/1GA PC$6.25/MF$1.45
Oconee Area Planning and Development Commission, Milledgeville, Ga.
ECONOMIC BASE AND POPULATION STUDY FOR SANDERSVILLE AND WASHINGTON COUNTY, GEORGIA.
Final rept.
Apr 73, 83p OAPDC-73-03

Descriptors: (*Regional planning, *Georgia), (*Economic development, Regional planning), Population growth, Trends, Manpower, Agriculture, Urban areas, Rural areas, Employment, Recommendations.
Identifiers: *Washington County(Georgia), Sandersville(Georgia).

The report contains analyses of the trends which have and are occurring in the economy and population of Sandersville and Washington County, GA. From these analyses, projections are made as to the nature and extent of economic and population growth which can be expected in the area over the next 20 years. Recommendations are also made as to several steps which may be taken in order that this growth may be realized.

PB-223 713/9GA PC$3.25/MF$1.45
Oconee Area Planning and Development Commission, Milledgeville, Ga.
PUBLIC IMPROVEMENTS PROGRAM AND CAPITAL BUDGET, SANDERSVILLE, GA.
Final rept.
Mar 73, 25p OAPDC-73-08

Descriptors: (*Urban planning, *Georgia), Financial management, Budgeting, Capital, Revenue, Income, Expenses, Grants, Assessments, Taxes.
Identifiers: *Sandersville(Georgia).

The purpose of the report is to provide a medium range financial planning program. An analysis of the financial condition of the city is accompanied by the identification and scheduling of capital improvements anticipated during the planning period.

PB-223 714/7GA PC$5.75/MF$1.45
Oconee Area Planning and Development Commission, Milledgeville, Ga.
HOUSING AGGREGATE MARKET ANALYSIS, SANDERSVILLE, GA.
Final rept.,
Robert A. Sloan. Apr 73, 73p OAPDC-73-09

Descriptors: (*Urban planning, *Georgia), (*Residential buildings, Urban planning), Market research, Supply(Economics), Demand(Economics), Marketing, Inventories, Trends, Houses, Trailers, Income.
Identifiers: *Sandersville(Georgia).

The purpose of the study is to provide governing authorities and other agencies and organizations responsible for housing in the planning area, with an estimated aggregate supply of and demand for housing in the planning area.

PB-223 718/9GA PC$12.75/MF$1.45
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
SUPPLEMENTAL REPORT ON AIR POLLUTION CONTROL ACTIVITIES IN FOREIGN COUNTRIES. SECOND YEAR OF PROFILE STUDY.
Jun 73, 681p* EPA-450/3-73-001
Contract CPA-22-69-68
See also report dated Nov 70, PB-196 841.

Descriptors: (*Air pollution, *Foreign government), Geography, Political systems, Organizations, Trends, Europe, South America, North America, Asia.
Identifiers: *Air pollution abatement, Foreign countries.

A synopsis of air pollution control activities is presented for 35 countries which were not covered in the original report (PB-196 841). Some of the texts for the original 13 countries were revised and are included. For each country the profile includes a discussion of geography, political features, current air pollution controls, and future trends, followed by an outline of the relationships among major organizations active in air pollution control. Regional intergovernmental organizations with programs relating to the environment are also indicated. A photographic reproduction of a set of index cards are presented for individual air pollution related organizations in each of the countries covered by the profile texts. (Author)

PB-223 726/1GA PC-GPO/MF$1.45-NTIS
Colorado Univ., Boulder. Dept. of Civil and Environmental Engineering.
EVALUATION OF TREATMENT FOR URBAN WASTE REUSE.
Environmental protection technology series rept.,
K. D. Linstedt, and E. R. Bennett. Jul 73, 146p
EPA-R2-73-122, W73-14750
Paper copy available from GPO $2.10 as EP1.23/2:73-122.

Descriptors: (*Chemical removal(Sewage treatment), *Sewage treatment), (*Nitrification, Sewage treatment), (*Clarification, Sewage treatment), Pilot plants, Alums, Calcium oxides, Water reclamation, Water supply, Activated sludge process, Optimization, Coagulation, Trace elements, Process charting, Water conservation.
Identifiers: Tertiary sewage treatment.

The efficacy of combining biological nitrification with each of two modes of chemical clarification is evaluated for production of a water suitable for specific industrial reuse applications. A 7200 gpd pilot plant was constructed, operated and analyzed. In the conventional clarification system, low doses of lime or alum were effective in removing greater than 95% of the BOD, turbidity, and

suspended solids from the nitrified secondary effluent. Efficient phosphorus removals necessitated higher lime and alum additions of 300 mg/liter, and 100-150 mg/liter, respectively. At the higher line doses, a two-fold reduction in bacterial organisms was achieved. Specific heavy metals were removed through both alum and lime additions. With either coagulant chemical, practical rapid sand filter runs of 16 hours were possible. Similar removal results were obtained with alum in a high-rate clarification flow system with direct duel-media filtration of alum flocculated wastewater. Filter runs of 5-6 hours could be realized. (Modified author abstract)

PB-223 728/7GA PC$3.50/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL RECONNAISSANCE SURVEY, YORK COUNTY, SOUTH CAROLINA.
Jun 73, 26p SC-40-0014-0690
Prepared by Catawba Regional Planning Council, Rock Hill, S.C.

Descriptors: (*Regional planning, *South Carolina), Objectives, Recommendations, Central city, Residential buildings, Transportation, Project planning, Industrial buildings, Land use, Services.
Identifiers: *York County(South Carolina).

The report is a standard reconnaissance survey conducted in accordance with HUD 701 procedures. It is designed to identify the problems and needs of York County that can benefit by planning and to devise a comprehensive planning program tailored to county's requirements. (Author)

PB-223 738/6GA PC$3.00/MF$1.45
Transportation System Center, Cambridge, Mass.
GRADE CROSSING PROTECTION IN HIGH-SPEED, HIGH-DENSITY, PASSENGER-SERVICE RAIL CORRIDORS.
Final rept. Jan-Feb 73,
John P. Hopkins. Sep 73, 40p* DOT-TSC-FRA-73-3 FRA-ORD/D-12
Contract DOT-RR-302

Descriptors: (*Railroads, *Intersections), (*Highways, Vehicular traffic control), (*Rapid transit railways, *Traffic safety), Traffic signals, Warning systems, Research, Actuation, Barriers.
Identifiers: *Grade crossings.

The report is a preliminary examination of special aspects of grade crossing protection for operation of high-speed passenger trains in rail corridors for which complete grade separation is not possible. Overall system needs and constraints are indicated, and their implications examined. Applications of conventional and improved hardware is considered, with special attention to activation criteria, appropriate motorist-warning devices, stalled-vehicle indicators, and trainmounted components. Non-technical aspects of the problem are also discussed, and areas for which future research efforts may be appropriate are identified.

PB-223 747/7GA PC$4.50/MF$1.45
South Carolina Administration Div., Columbia.
CENTRAL BUSINESS DISTRICT PLAN, YORK, SOUTH CAROLINA.
Jun 73, 50p SC-40-0014-0617
Prepared by LBC and W Consultants, Columbia, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Central city, Urban planning), Commerce, Land use, Urban areas, Parking facilities, Vehicular traffic control.
Identifiers: *York(South Carolina).

The report inventories and analyzes facilities currently available and anticipates steps which will need to be taken if the downtown commercial area is to remain economically viable in the face of established competition in the immediate region.

PB-223 750/1GA PC$3.50/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT FOR FOLLY ISLAND, SOUTH CAROLINA.
Jun 73, 26p SC-40-0014-0728 CPA-SC-04-12-1003-9(1)
Prepared by Berkeley-Charleston-Dorchester Regional Planning Council, Columbia, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Residential buildings, Urban planning), Beaches, Construction, Project planning, Recommendations, Land use, Inventories, Population growth, Trends.
Identifiers: *Folly Island(South Carolina).

The report is the first housing study published for the Folly Beach area. It includes an analysis of the area's population; general economic situation; and housing inventory based upon existing conditions and building trends. The final section of the study outlines a housing program and objectives for Folly Beach which encompasses recommendations for residential redevelopment as well as development.

PB-223 752/7GA PC$7.25/MF$1.45
Illinois Inst. for Environmental Quality, Chicago.
COMPOSTING APPLICATIONS FOR ILLINOIS.
Final rept.,
Daniel L. Eberhardt, and Wesley O. Pipes. Oct 72, 102p IIEQ-73-5
Solid Waste Management Series report. Prepared by Northwestern Univ., Evanston, Ill. Dept. of Civil Engineering.

Descriptors: (*Solid waste disposal, *Composts), (*Illinois, Solid waste disposal), Biodeterioration, Leaves(Botany), Refuse disposal, Communition, Design, Digesters, Organic wastes, Industrial wastes, Sewage disposal, Utilization, Shredding, Separators.
Identifiers: Manure.

This report is directed toward a study of the feasibility of using composting as a solid waste disposal technique in Illinois. One major composting project which has been carried out on a large scale is described. There is also a general treatment of the principles of composting, as well as the methods and equipment used. Information such as the chemical and biological composition of compost, names of equipment manufacturers, and cost figures of different disposal techniques is included. (Modified author abstract)

PB-223 753/5GA PC$7.75/MF$1.45
South Carolina Administration Div., Columbia.
THE DEVELOPMENT PLAN, TOWN OF MOUNT PLEASANT AND ITS ENVIRONS.
Jun 73, 114p SC-40-0014-0726
Prepared by Berkeley-Charleston-Dorchester Regional Planning Council.

Descriptors: (*Urban planning, *South Carolina), (*Land use, Urban planning), Objectives, Residential buildings, Commercial buildings, Industrial buildings, Roads, Public buildings, Education, Recreation, Community development.
Identifiers: *Mount Pleasant(South Carolina).

The plan is presented in the format of an outline in order to present issues and concepts as simply as possible. A primary objective of this particular document is to encourage community involvement in a continuing planning program where its goals and objectives for land use will be a topic of major concern and periodically revised. (Modified author abstract)

PB-223 754/3GA PC$6.50/MF$1.45
South Carolina Administration Div., Columbia.
LAND DEVELOPMENT PLAN, YORK COUNTY, SOUTH CAROLINA.
Jul 73, 87p SC-40-0014-0680
Prepared by Vismor, McGill and Bell, Inc., Columbia, S.C.

Descriptors: (*Regional planning, *South Carolina), (*Land use, Regional planning), Geophysical surveys, Residential buildings, Commercial buildings, Industrial buildings, Parks, Streets, Economic development, Land development, Recommendations, Population growth.
Identifiers: *York County(South Carolina).

The report includes a land use survey of all unincorporated areas of the county and the towns of McConnells, Sharon and Hickory Grove. This survey, coupled with an analysis of existing land uses, physical constraints on land use, identification of major land use generators, population and economic influences form the basis for a land use plan for York County to the year 1990. (Author)

PB-223 755/0GA PC$4.50/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT FOR MT. PLEASANT, SOUTH CAROLINA.
Jun 73, 50p SC-40-0014-0727
Prepared by Berkeley-Charleston-Dorchester Regional Planning Council, Charleston, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Residential buildings, Urban planning), Population(Statistics), Income, Employment, Inventories, Supply(Economics), Demand(Economics), Construction, History, Renovating, Building codes, Recommendations.
Identifiers: *Mount Pleasant(South Carolina).

The report is the first housing study published for the Mt. Pleasant area. It includes an analysis of the area's population; general economic situation; and housing inventory based upon existing conditions and building trends. The final section of the study outlines a housing program and objectives for Mt. Pleasant which encompasses recommendations for residential rehabilitation as well as preservation. (Author)

PB-223 764/2GA PC$6.00/MF$1.45
South Carolina Administration Div., Columbia.
GREENWOOD COUNTY GOVERNMENTAL ADMINISTRATION STUDY.
Jun 73, 87p SC-40-0014-0656
Prepared by Vismor, McGill and Bell, Inc., Columbia, S.C.

Descriptors: (*Regional planning, *South Carolina), (*Local government, Regional planning), Evaluation, Management.
Identifiers: Greenwood County(South Carolina).

Wholesale changes related to local government have recently been made in the South Carolina Constitution. It is anticipated that all local governments in the State will have to reestablish themselves within the next several years to bring their governmental structures in accord with these new constitutional provisions. The study attempts to address this problem on behalf of Greenwood County government by evaluating the current form of government assessing alternatives and recommending approaches based on said alternatives.

PB-223 765/9GA PC$5.25/MF$1.45
South Carolina Administration Div., Columbia.
DEVELOPMENT PLAN, TOWNSHIP OF FOLLY ISLAND.
Jun 73, 64p SC-40-0014-0725
Prepared by Berkeley-Charleston-Dorchester Regional Planning Council, Charleston, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Land use, Urban planning), Policies, Community development, Streets, Roads, Residential buildings, Commercial buildings, Parks, Recreation, Highways, Recommendations.
Identifiers: *Folly Island(South Carolina).

The report describes the goals and policies for the development of Folly Island in the long range future. It includes an analysis of existing land use

patterns, physical features, population trends and economic opportunities. Problems facing the community are identified and methods to eliminate them are suggested. An estimate is made of the future changes and the opportunities of development of the highest and best land uses on the Island. Different elements of future development of the township are presented, including the land use plan, preliminary thoroughfare plan and community facilities plan. (Modified author abstract)

PB-223 766/7GA PC$5.75/MF$1.45
Greenville County Planning Commission, S.C.
ZONING ORDINANCE, CITY OF MAULDIN, SOUTH CAROLINA.
Jun 73, 73p SC-40-0014-0672

Descriptors: (*Urban planning, *South Carolina), (*Land use zoning, Urban planning), Regulations, Ordinances, Urban areas.
Identifiers: Mauldin(South Carolina), Greenville County(South Carolina).

In 1972 the city's General Development Plan was reviewed and updated. Based upon that update, a new zoning ordinance has been prepared.

PB-223 768/3GA PC$3.00/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT, SALUDA COUNTY, SOUTH CAROLINA.
May 73, 18p SC-40-0014-0614
Prepared by LBC and W Consultants/Planning-Research-Management, Inc.

Descriptors: (*Regional planning, *South Carolina), (*Residential buildings, Regional planning), Standards, Construction, Project planning, Recommendations, Inventories.
Identifiers: *Saluda County(South Carolina).

The report analyzes the housing situation in Saluda County, S.C., identifying housing inventories and problems. Its basic purpose is to survey and record the existing situation while documenting citizen concerns which should be considered in determining future actions. Projections of future standard housing requirements are made. Recommendations are made as to the first steps the county should take in attacking its housing related problems, and a three year action program is outlined. (Author)

PB-223 770/9GA PC$4.50/MF$1.45
South Carolina Administration Div., Columbia.
LAND USE PLAN, SALUDA COUNTY, SOUTH CAROLINA.
Jun 73, 47p SC-40-0014-0615
Prepared by LBC and W, Consultants/Planning-Research-Management, Inc., Columbia, S.C.

Descriptors: (*Regional planning, *South Carolina), (*Land use, Regional planning), Economic development, Project planning, Residential buildings, Commercial buildings, Industrial buildings, Recreational facilities, Parks, Streets.
Identifiers: *Saluda County(South Carolina).

The report presents a plan for future land use in Saluda County, S.C. It is based upon analyses of physical and socio-economic determinants which are expected to influence development in the county between now and 1990. The report suggests programs for implementing the plan proposals, which include preliminary thoroughfare plans. (Author)

PB-223 771/7GA PC$4.25/MF$1.45
South Carolina Administration Div., Columbia.
OPEN SPACE AND RECREATION PLAN, CITY OF BEAUFORT, SOUTH CAROLINA.
Jun 73, 44p SC-40-0014-0675
Prepared by Beaufort County Joint Planning Commission, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Recreation, Urban planning), Land use, Parks, Recreational facilities, Cost estimates, Projects, Recommendations.
Identifiers: Beaufort(South Carolina).

The study analyzes the existing recreation areas and recreation program in the city of Beaufort with present growth trends, neighborhood conditions and composition, current improvement plans and future demands based on recreation characteristics considered. Recommendations for improvement to existing recreation areas and programs as well as recommendations for new facilities and programs are given with a development schedule and estimated costs. (Author)

PB-223 783/2GA PC$4.25/MF$1.45
Greensboro Community Development Program, N.C.
GREENSBORO COMMUNITY DEVELOPMENT MANAGEMENT SYSTEM.
Interim rept.
Jul 73, 41p
Prepared in cooperation with KRS Associates, Reston, Va

Descriptors: (*Urban planning, *North Carolina), (*Community development, Urban planning), Management systems, Project planning, Inventories, Benefit cost analysis, Objectives, Simulation, Evaluation.
Identifiers: *Greensboro(North Carolina).

The community development management system is a critical path model which allows decision makers greater flexibility in scheduling, monitoring, and evaluating activities in any one or all community development projects. The system allows managers to test alternatives in respect to priorities and the availability of resources. Greensboro will have the capability to inventory which projects can be started and completed in a given time frame, array those projects by priority and allocate resources to those projects by priority. Further, Greensboro will have the capability to monitor and evaluate those projects with respect to cost-benefit and changing objectives of the local administration and community. The greatest advantage of the community development management system is that it allows decision makers to simulate how one project affects other projects and community objectives. (Author)

PB-223 784/0GA PC$5.25/MF$1.45
South Carolina Administration Div., Columbia.
DEVELOPMENT PLAN MCCLELLANVILLE AREA, SOUTH CAROLINA.
Jun 73, 62p SC-40-0014-0732

Descriptors: (*Urban planning, *South Carolina), Land use, Economic analysis, Community development, Transportation.
Identifiers: McClellanville(South Carolina).

The report describes the goals and policies for the development of McClellanville Area in the long range future. It includes an analysis of existing land use pattern, physical features, population trends and economic opportunities. Problems facing the community are identified and methods to eliminate them are suggested. Different elements of future development of the area are presented in the sections: Land Use Plan, Preliminary Thoroughfares Plan and Community Facilities Plan. Specific goals and policies for effectuating the different elements of the plans are also presented.

PB-223 792/3GA PC$3.00/MF$1.45
Northwest Missouri Regional Planning Commission, Maryville.
REGIONAL WATER AND SEWER CAPITAL IMPROVEMENTS PROGRAM.
Jun 73, 14p NWMRPC-73-303

Descriptors: (*Regional planning, *Missouri), (*Water supply, Regional planning), (*Sewers, Regional planning), Improvement, Projects, Financial management.

As part of its continuing planning and management program the Regional Planning Commission is responsible for maintaining a current capital improvements program dealing with public facility improvements within the local entities in the Region. The report deals with water and sewer improvements in the region.

PB-223 795/6GA PC$7.25/MF$1.45
South Dakota Planning and Development District, Commission (4th), Aberdeen.
SPINK COUNTY COMPREHENSIVE PLAN. PART I.
Final rept.
Sep 73, 101p SD-4DPDC-8
Prepared by State Planning Bureau, Pierre, S. Dak.

Descriptors: (*Regional planning, *South Dakota), Policies, Economic analysis, Natural resources, Land use, Public utilities.
Identifiers: Spink County(South Dakota).

The report discusses the historical background, geographical and physical factors, social and economic factors, major issues facing the County, problem areas, and opportunities that can assist the County toward achieving its goals and objectives.

PB-223 798/0GA PC$6.75/MF$1.45
South Carolina Administrative Div., Columbia.
ABBEVILLE COUNTY DEVELOPMENT PLAN.
30 Jun 73, 92p SC-40-0014-0655
Prepared by Vismor, McGill and Bell, Inc., Columbia, S.C.

Descriptors: (*Regional planning, *South Carolina), Land use, Community development, Parks, Streets, Economic analysis.
Identifiers: Abbeville County(South Carolina).

The study analyzes existing land use characteristics in selected portions of Abbeville County, South Carolina (including the Towns of Calhoun Falls, Lowndesille, Ware Shoals, Donalds, Due West and the Lake Secession area), evaluates prime impact features which will affect the county's long-range growth, and, finally, recommends a plan for the future development of land use and thoroughfares in the county.

PB-223 805/3GA PC$31.00/MF$1.45
Mississippi-Arkansas-Tennessee Council of Governments.
WATER SYSTEMS COORDINATION PLAN AND DEVELOPMENT PROGRAM. PHASE II. WATER SUPPLY SYSTEMS, WASTEWATER POLLUTION CONTROL SYSTEMS AND SURFACE WATER DRAINAGE SYSTEMS.
May 73, 576p MATCG-ER-73-1005-10
Prepared by Ellers, Reaves, Fanning and Oakley, Inc., Memphis, Tenn. See also report dated Jun 72, PB-211 829.

Descriptors: (*Regional planning, *Water resources), (*Mississippi, Regional planning), (*Arkansas, Regional planning), (*Tennessee, Regional planning), Water supply, Water quality, Management planning, Water pollution, Water treatment, Sewage treatment, Surface water runoff, Geography, National government, State government, Local government, Land use.
Identifiers: *DeSoto County(Mississippi), *Shelby County(Tennessee), *Crittenden County(Arkansas), Water pollution abatement.

This is the second in a planned series of three reports concerning water supply, wastewater pollution control and surfacewater drainage systems of the 3-county area including DeSoto County, Mis-

sissippi, Crittenden County, Arkansas, and Shelby County, Tennessee. It presents an officially coordinated long range plan and short range program for these systems.

PB-223 876/4GA PC$11.50/MF$1.45
National Park Service, Denver, Colo. Historic Preservation Team.
HISTORIC RESOURCE STUDY EAST AND WEST POTOMAC PARKS: A HISTORY,
Gordon Chapell. Jun 73, 186p FNP-PHH-73-137

Descriptors: (*Parks, *District of Columbia), Reviews, Land reclamation, Land development, Channel improvements, Recreational facilities, Public land, History, Urban planning, Virginia, Maryland.
Identifiers: *Potomac Park.

The purpose of the study is to present some of the more significant data relating to the history of Potomac Park. The author presents the story of reclamation and, park development, while suggesting that for those who desire greater detail in particular areas of this history they would be advised to study the mass of manuscript material in the National Archives and in Alexandria. The author writes concerning the reclamation and development of this land during the early years of the 19th century, decisions affecting its use, and includes some of the more important aspects of the legislative history of Potomac Park. The report is well documented and includes a number of appendices with valuable supplementary data.

PB-223 893/9GA PC$3.25/MF$1.45
Piedmont Triad Council of Governments, Greensboro, N.C.
POPULATION, ECONOMY, AND LAND USE STUDY. REGIONAL DEVELOPMENT GUIDE. PHASE I. SUMMARY REPT.,
D. Gordon Bennett, Charles R. Hayes, and Lynda Sowers. May 71, 25p

Descriptors: (*Regional planning, *North Carolina), (*Community development, Surveys), Demographic surveys, Economic surveys, Land use, Statistical data, Recommendations, Urban areas, Rural areas, Forecasting.
Identifiers: Counties.

The report provides a summary of existing population, economy, and land use data for the Piedmont Triad Region which consists of Alamance, Caswell, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry and Yadkin Counties. Included are general recommendations for future action, indications of population to 2020, economic prospects, land use trends, and growth-decline prospects.

PB-223 894/7GA PC$7.00/MF$1.45
Piedmont Triad Council of Governments, Greensboro, N. C.
A DEVELOPMENT STANDARDS AND CODES STUDY.
Jan 71, 100p
Prepared by the Research Group, Inc., Atlanta, Ga.

Descriptors: (*Regional planning, *North Carolina), (*Building codes, Regional planning), Standardization, Coordination, Land use zoning, Regulations, Plumbing, Electric equipment, Buildings, Regulations, Project planning, Management, Local government.

The report provides a comprehensive analysis of existing development standards in the council area. The analysis includes zoning ordinances, subdivision regulations, mobile homes regulations, building, plumbing, electrical, and housing codes. The report includes recommendations for the coordination and standardization of development standards. Specific recommendations are set forth for sub-regional administration of development standards, training and technical assistance for the Council of Governments. A program design, legal requirements, and staffing plans are also included in the report. (Author)

PB-223 900/2GA PC$3.50/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg.
ON DEVELOPING A MODEL FOR COORDINATING MULTI-MODAL TRANSPORTATION PLANNING WITH LAND USE PLANNING,
Robert A. Scholl, and John W. Dickey. Jun 73, 63p* UMTA-VA-11-0001-73-1

Descriptors: (*Urban transportation, Urban planning), (*Land use, Urban transportation), Mathematical models, Compatibility, Economic factors, Revenue, Virginia.
Identifiers: Computer aided analysis, *Multimodal transportation models.

The paper addresses the issue of developing a model which would provide a methodological approach to multi-modal transportation planning which would be coordinated with land use planning. The research focuses on the task of integrating multi-modal considerations into the land-use allocation technique called TOPAZ, a computer process which was created to provide a workable tool to aid in sketch-plan generation and analysis.

PB-223 919/2GA PC$6.00/MF$1.45
Denver Urban Observatory, Colo.
URBAN SOCIAL INDICATORS: SELECTED CONDITIONS AND TRENDS IN DENVER AND ITS METROPOLITAN AREA.
Final rept.,
Wilbert E. Moore, and M. Jay Crowe. Jun 73, 80p UO-LCCM-DEN-73-009
Contract HUD-H-987

Descriptors: (*Urban planning, *Colorado), (*Urban sociology, Urban planning), Indexes(Ratios), Air pollution, Health, Safety, Education, Employment, Income, Houses.
Identifiers: Denver(Colorado), *Housing and urban development research.

The report explores the kinds of data available that could be utilized for the development of social indicators of urban change in Denver and the standard metropolitan statistical area and serves as a part of an intercity program to develop urban social indicators on a comparative basis, which will permit comparisons among a group of cities in the Urban Observatory network. The areas of social concern for which indicator information is presented are: physical environment (air pollution), health, public safety, education, housing, and employment and income, with special emphasis given to employment indicators.

PB-223 920/0GA PC$3.75/MF$1.45
New York City Planning Commission.
NEW DWELLING UNITS COMPLETED 1972. NEW YORK CITY COMMUNITY PLANNING DISTRICTS.
Aug 73, 32p NYC-DCP-73-70

Descriptors: (*Urban planning, *New York), (*Residential buildings, Urban planning), Houses, Project planning, Construction, Financial management, Taxes, Maps.
Identifiers: Low income housing, Moderate income housing, New York City(New York).

The report is the second in a series, following New Dwelling Units Completed 1921-1971 in New York City. The publication, however, goes beyond the first in providing data on new housing completions arranged not only by type of funding (public, publicly aided, private) and number of units by type of structure (one family, two family, three or more) but also displays the information by smaller geographic units than the city and the five boroughs. It categorizes the data by Community Planning District. The 62 CPD's of New York City are the most useful geographic unit for analysis. In addition there is a breakdown of private structure by tax status (with partial tax exemption, without tax exemption). The information is frequently required and requested by those in urban analysis planning, policy making and forecasting. These data are essential for housing studies as well as for other aspects of the city's needs. An introduction summarizes and analyzes housing trends during the year.

PB-223 925/9GA PC$22.25/MF$1.45
South Carolina Administration Div., Columbia.
SPARTANBURG FUNCTIONAL ANALYSIS STUDY.
Jun 73, 402p SC-40-0014-0723
Prepared in cooperation with LBC/W Consultants/Planning-Research-Management, Inc., Columbia, S.C. and Public Research and Management, Inc., Atlanta, Ga.

Descriptors: (*Regional planning, *South Carolina), (*Urban planning, South Carolina), Revenue, Sewers, Water supply, Local government, Fire protection, Law enforcement, Parks, Public utilities, Cost analysis, Budgeting, Management.
Identifiers: Spartanburg County(South Carolina), Spartanburg(South Carolina).

The analysis and study of governmental agencies in Spartanburg County, including the municipalities and special districts covered five areas: Governmental Administration, Public Safety, Public Works, Public Utilities, and Recreation Activities. Agencies were surveyed by questionnaire and personal interview to secure information on organization, administration, personnel policies, operational procedures, financial data on resources and costs, and political considerations. The functions of government were examined and analyzed in terms of current service practices and alternatives for improvement.

PB-223 927/5GA PC$7.25/MF$1.45
South Central Alabama Development Commission, Montgomery.
LAND DEVELOPMENT PLAN, BRUNDIDGE, ALABAMA.
Final rept.
Jun 73, 104p ALA-SCA-XX05-1020-05

Descriptors: (*Urban planning, *Alabama), (*Land development, Urban planning), Surveys, Land use, Community development, Streets, Transportation, Schools, Parks, Health, Sanitary engineering.
Identifiers: Brundidge(Alabama).

The study contains the results of a survey, inventory and analysis of existing land use, and land development patterns in and around the Town of Brundidge. It sets forth a plan for future development and an improved system for facilitating traffic.

PB-223 930/9GA PC$3.75/MF$1.45
Texas Tech Univ., Lubbock. Water Resources Research Center.
VARIATION OF THE URBAN RUNOFF QUALITY WITH DURATION INTENSITY OF STORMS. PHASE II.
Project completion rept.,
Dan M. Wells, James F. Anderson, Robert M. Sweazy, and B. J. Claborn. 31 Aug 73, 96p* WRC-73-2 OWRR-B-104-TEX(1), W73-73-14771
Contract DI-14-31-0001-3654
See also PB-195 785.

Descriptors: (*Surface water runoff, *Urban areas), (*Hydrology, Surface water runoff), (*Water pollution, Surface water runoff), Chemical composition, Water quality, Biochemical ox-

ygen demand, Coliform bacteria, Solids, Nitrogen, Phosphorus, Rainfall intensity.
Identifiers: *Storm water runoff, Urban hydrology, Chemical oxygen demand, Lubbock(Texas).

The variation of urban runoff quality was investigated with the duration and intensity of storms. The data obtained were analyzed using stepwise linear regression to determine significant trends in how storm characteristics and antecedent conditions affect runoff quality. The project utilized a 223-acre watershed located within south-central Lubbock, Texas although the results should be applicable to other areas. Samples were analyzed for total and fecal coliform, chemical oxygen demand, biochemical oxygen demand, total residue, volatile residue, total suspended solids, volatile suspended solids, pH, alkalinity, nitrate nitrogen, and orthophosphate.

PB-223 931/7GA PC$3.75/MF$1.45
Minnesota Univ., St. Paul. Dept. of Agricultural and Applied Economics.
SOCIAL/ENVIRONMENTAL SYSTEMS FOR REGIONAL DEVELOPMENT PLANNING.
Mimeograph rept.,
Wilbur R. Maki. 1973, 32p OWRR-B-044-Minn(2), W73-14860
Contract DI-14-31-0001-3293

Descriptors: (*Economic development, *Minnesota), (*Regional planning, *North Dakota), Policies, Demography, Economic surveys, Output, Employment, Earnings, Income, Environmental engineering, Land use, Improvement, Financing, Plant location, Computer programming, Mathematical models.
Identifiers: Capital improvements.

Information needs for implementing public programs of resource use and control are discussed. Economic models for producing the needed data are presented as activity components of an extensive computer modeling capability. The activity components are building blocks in the construction of a workable system for relating research findings to management and policy questions in regional development. A series of activity components are presented as elements of a regional system; these elements are identified as follows: population, demand, output and employment, earnings and income, capital improvements and financing, facility location, land use, environmental management, public financing and public policy. Portions of this document are not fully legible.

PB-223 933/3GA PC$5.50/MF$1.45
Santee-Wateree Regional Planning Council, Sumter, S.C.
LAND DEVELOPMENT PLAN CITY OF SUMTER, SOUTH CAROLINA.
Jun 73, 69p SC-40-0014-0662

Descriptors: (*Urban planning, *South Carolina), (*Land development, Urban planning), Community development, Land use, Economic factors, Streets, Residential buildings.
Identifiers: Sumter(South Carolina).

The study presents inventory, analysis and plans for the orderly and efficient development through the year 2000 of the Sumter City Planning Area. Included are summary of population and economic trends, a review of the physical environment, a statement of areawide goals, an identification of major land use generators and a discussion of implementation concepts.

PB-223 939/0GA PC$4.00/MF$1.45
North Central Alabama Regional Council of Governments, Decatur.
LAND SUBDIVISION REGULATIONS OF TRINITY, ALABAMA.
Final rept.,
C. Ronald Matthews. May 73, 36p ALA-NCA-1705-1020-02

Descriptors: (*Urban planning, *Alabama), (*Land use zoning, Urban planning), Regulations, Ordinances, Urban areas.
Identifiers: Trinity(Alabama).

The document sets forth regulatory measures designed to govern the platting of land and the development of residential concentrations. Measures are proposed that provide for the regulation of such matters as street arrangements that conform with the comprehensive plan; adequate open space for recreational facilities, traffic, light, and air; and for the avoidance of congestion of the population.

PB-223 949/9GA PC$8.50/MF$1.45
Alabama Development Office, Montgomery.
EVALUATION OF COMPREHENSIVE PLAN TALLASSEE, ALABAMA.
Final rept.
Jun 73, 127p ALA-PSI-1665-1020-01
Prepared in cooperation with the Public Systems, Inc., Huntsville, Ala.

Descriptors: (*Urban planning, *Alabama), Projects, Planning, Local government, Community development, Evaluation.
Identifiers: Tallassee(Alabama).

The report represents an assessment of the Comprehensive Planning Documents prepared for the use of the City of Tallassee. The report is directed at determining the usefulness of these planning documents to the City Administration, the extent to which the plans have been implemented to date, and the impact of planned development activities on the Tallassee community.

PB-223 950/7GA PC$4.50/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT, HAMPTON COUNTY, SOUTH CAROLINA.
Jun 73, 47p SC-40-0014-0601

Descriptors: (*Regional planning, *South Carolina), (*Residential buildings, Regional planning), Project planning, Construction, Houses, Recommendations.
Identifiers: Hampton County(South Carolina), Low income housing.

The report describes the general housing conditions and cites problems and obstacles to improved housing. It also sets forth proposed solutions and a program oriented to improving the low income housing situation of the county.

PB-223 951/5GA PC$4.00/MF$1.45
South Carolina Administration Div., Columbia.
HOUSING SURVEY, PLAN AND PROGRAM, PEE DEE REGION OF SOUTH CAROLINA. PHASE I. URBAN AREAS STRUCTURAL CONDITIONS SURVEY,
Thomas C. Hammond. Jun 73, 37p SC-40-0014-0585

Descriptors: (*Regional planning, South Carolina), (*Residential buildings, Regional planning), Surveys, Blighted areas, Urban areas, Structural analysis, Planning.

The report presents the results of a survey of substandard housing conditions in the ten urban towns of the six county Pee Dee Region of South Carolina. Housing conditions were anlyzed and appropriate areas designated for clearance or rehabilitation. This is the first of a series of studies designed to improve housing conditions in the Pee Dee Region. (Author)

PB-223 952/3GA PC$6.00/MF$1.45
South Carolina Administration Div., Columbia.
RECOMMENDED ZONING ORDINANCE, LAKE VIEW, SOUTH CAROLINA,
Thomas C. Hammond. Jun 73, 79p SC-40-0014-0584

Descriptors: (*Urban planning, *South Carolina), (*Land use zoning, Urban planning), Regulations, Ordinances, Urban areas.
Identifiers: Lake View(South Carolina).

For the purpose of controlling the use and development of land in accordance with a comprehensive plan, the town of Lake View has been subdivided into residential, commercial, industrial and other zoning districts. Appropriate land use regulations are set forth in each district. (Author)

PB-223 953/1GA PC$3.25/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT, LAKE VIEW, SOUTH CAROLINA,
Thomas C. Hammond. Jun 73, 23p SC-40-0014-0582

Descriptors: (*Urban planning, *South Carolina), (*Residential buildings, Urban planning), Objectives, Project planning, Surveys, Community development.
Identifiers: Lake View(South Carolina).

The report summarizes housing problems and deficiencies in Lake View; presents a statement of goals and objectives; and a statement of action-oriented planning activities. (Author)

PB-223 954/9GA PC$6.25/MF$1.45
South Carolina Administration Div., Columbia.
COMMUNITY FACILITIES PLAN, CAPITAL IMPROVEMENTS PROGRAM AND CAPITAL BUDGET, NORTH AUGUSTA, SOUTH CAROLINA.
Jul 73, 85p SC-40-0014-0687
Prepared by Lower Savannah Regional Planning and Development Council, Aiken, S.C.

Descriptors: (*Urban planning, *South Carolina), Schools, Recreational facilities, Police, Fire protection, Medical services, Public buildings, Improvement, Planning, Financing.
Identifiers: North Augusta(South Carolina).

The document contains three sections. The first is devoted to an examination of community facilities in the North Augusta Study Area. The second section contains a list of public improvements ranked in order of priority by year. The third section is a capital budget by department for fiscal year 1973 through 1979. (Author)

PB-223 955/6GA PC$4.25/MF$1.45
South Carolina Administration Div., Columbia.
INITIAL HOUSING ELEMENT, JASPER COUNTY, SOUTH CAROLINA.
Jun 73, 45p SC-40-0014-0600
Prepared by Jasper County Planning Commission, Ridgeland, S.C.

Descriptors: (*Regional planning, *South Carlina), (*Residential buildings, Regional planning), Houses, Construction, Project planning.
Identifiers: Jasper County(South Carolina), Low income housing.

The report describes general housing conditions and cites problems and obstacles to improved housing. It also sets forth proposed solutions and a five-year housing program oriented to improving the low income housing situation of the county. (Author)

PB-223 956/4GA PC$10.25/MF$1.45
South Carolina Administration Div., Columbia.
OPEN SPACE PLAN AND PROGRAM.
Jun 73, 163p SC-40-0014-0694
Prepared by Catawba Regional Planning Council, Rock Hill, S.C.

Descriptors: (*Regional planning, *South Carolina), (*Public land, Regional planning), Parks, Recreational facilities, Landscaping, Natural resources, Land use, Projects, Recommendations.

Identifiers: *Open space land.

The report examines the current recreation and open space trends and analyzes future open space and recreational potentials for the Catawba region. Land and population characteristics are analyzed. Recreation and open space facilities are inventoried. The recreational demands of the region's population are determined, and deficiencies are identified. A regional plan has been designed to satisfy existing and projected demand, and a schedule of program priorities has been developed. Agencies and methods of implementation are discussed. (Modified author abstract)

PB-223 967/1GA PC$8.00/MF$1.45
Alabama Development Office, Montgomery.
EVALUATION OF COMPREHENSIVE PLAN ANDALUSIA, ALABAMA.
Final rept.
Jun 73, 118p ALA-PSI-0055-1020-01
Prepared in cooperation with the Public Systems, Inc., Huntsville, Ala.

Descriptors: (*Urban planning, *Alabama), Projects, Planning, Local government, Evaluation, Community development.
Identifiers: Andalusia(Alabama).

The report represssessment of the Comprehensive Planning Documents prepared for the use of the City of Andalusia, Alabama. The report is directed at determining the usefullness of the planning documents to the City Administration, the extent to which the plans have been implemented to date, and the impact of planned development activities on the Andalusia community. (Author)

PB-223 968/9GA PC$6.00/MF$1.45
Birmingham Regional Planning Commission, Ala.
LEEDS, ALABAMA, DEVELOPMENT PLAN.
Final rept.
Jun 73, 76p Ala-BRP-0380-1020-5

Descriptors: (*Urban planning, *Alabama), Economic factors, Land use, Land development, Residential buildings, Transportation.
Identifiers: Leeds(Alabama).

The Land Development Plan examines the physical characteristics, population and economy, community facilities, and existing land use in order to formulate a Future Land Use Plan for the City of Leeds, Alabama. The Initial Housing Element discusses the problems and obstacles in the City to better housing and develops housing objectives and a three to five year housing program. The Transportation Plan surveys the existing thoroughfare condition and recommends additions to the transportation system to meet the needs of the future.

PB-223 974/7GA PC$4.00/MF$1.45
South Alabama Regional Planning Commission, Mobile.
MAJOR THOROUGHFARE PLAN, FOLEY, ALABAMA.
Final rept.
Jun 73, 38p ALA-SAR-0645-1020-05

Descriptors: (*Urban planning, *Alabama), Transportation, Streets, Neighborhoods.
Identifiers: Foley(Alabama).

The report presents a major thoroughfare plan for the City of Foley, Alabama. The plan provides a framework for development of Foley's streets on a neighborhood and community basis that is consistent with the Regional Transportation Plan. The plan will accommodate travel desires of Foley's population through the Year 2000 on a functional system of traffic circulation that is compatible with the Land Use Plan.

PB-223 978/8GA PC$3.50/MF$1.45
South Alabama Regional Planning Commission, Mobile.
SUBDIVISION REGULATIONS, FOLEY, ALABAMA.
Final rept.
Jun 73, 29p ALA-SAR-0645-1020-07

Descriptors: (*Urban planning, *Alabama), (*Land use zoning, Urban planning), Regulations, Ordinances, Urban areas.
Identifiers: Foley(Alabama).

The report presents the Subdivision Regulations for the City of Foley. The main purpose of such regulations is to insure that the City has some guarantee that the design of streets, lot layouts, installation of utilities, reservation or dedication of parks, street rights-of-way, and other factors involving the subdivision of land will coincide with the interests and welfare of the entire community. Subdivision regulations also help to prevent the exploitation of land and the exploitation of the prospective land purchaser.

PB-223 990/3GA PC$6.50/MF$1.45
Piedmont Triad Council of Governments, Greensboro, N.C.
REGIONAL OPEN SPACE STUDY. PHASE II.
Final rept.
Apr 73, 89p
See also Phase 1, PB-212 674.

Descriptors: (*Regional planning, *North Carolina), Natural resources, Landscaping, Public land, Parks.

Phase II of the Study is the second step toward developing an Open Space Plan and Program for the 11-county Region. The report describes natural features of the land, historic and cultural sites which should be protected; develops a process for open space site selection; and sets forth preliminary recommendations for an Open Space Plan and Program.

RLO-2225-T-20-8/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Chemistry.
MODEL OF THE ACCUMULATION OF FOSSIL CO SUB 2 IN THE ATMOSPHERE AND THE SEA.
A. W. Fairhall. 1972, 16p

Descriptors: (*Carbon dioxide, *Buildup), (*Earth atmosphere, Carbon dioxide), (*Seas, Carbon dioxide), Combustion, Diffusion, Fossil fuels, Mathematical models, Retention, Seawater.

For abstract, see NSA 28 02, number 02643.

13C. Construction Equipment Materials, and Supplies

AD-767 312/2GA PC$3.00/MF$1.45
California Univ Berkeley Structural Engineering Lab
DURABILITY OF CEMENT CONCRETE IN SULFATE ENVIRONMENT.
Interim technical rept.,
P. K. Mehta, and R. B. Williamson. Sep 73, 26p*
Rept nos. UCSESM-73-12, TR-7
Contract N00014-69-A-02000-1007
Report on Structures and Materials Research.

Descriptors: (*Concrete, *Corrosion), (*Cements, Corrosion), Sea water, Reviews, California, Sulfates, Tests.
Identifiers: Portland cements, Sulfate resisting cements.

Sulfate attack phenomenon in cement concrete is reviewed. Summary of test results on 67 years old massive concrete blocks lying submerged in sea water of the Los Angeles Harbor is presented. Surface deterioration of concrete which was more permeable gave evidence of sulfate attack. Review of some recent field and laboratory studies shows that under certain conditions even good quality cements made with sulfate resisting type portland cements can be vulnerable to long-time sulfate attack. Problems associated with lack of adequate correlation between the laboratory tests and the field performance of cement concretes exposed to sulfate waters are described, and a new laboratory test method which is quick and reliable is presented. Results are given for 5 different types of cements tested according to the new method. (Author)

AD-767 433/6GA Reprint
California Univ Berkeley Structural Engineering Lab
EFFECT OF LIME ON HYDRATION OF PASTES CONTAINING GYPSUM AND CALCIUM ALUMINATES OR CALCIUM SULFOALUMINATE.
Technical rept.,
P. K. Mehta. 16 Feb 73, 8p Rept nos. UCSESM-73-10, TR-6
Contract N00014-69-A-0200-1007
Presented at the Annual Meeting (74th), American Ceramic Society, Washington, D. C., 8 May 72 (Cement Div., No. 14-T-72). Revision of report dated 6 Nov 72.
Availability: Pub. in Jnl. of the American Ceramic Society, v56 n6 p315-319 Jun 73.

Descriptors: (*Calcium compounds, Hydrates), (*Cements, Hydrates), (*Aluminates, Hydrates), (*Sulfates, Hydrates), Gypsum, Calcium oxides, Reaction kinetics.
Identifiers: Expanding cements, *Calcium aluminate sulfate, Hydration, Calcium aluminate, Calcium sulfates.

Chemical reactions responsible for ettringite formation in the commercial expansive cements are reviewed. X-ray diffraction analyses of the hydrated expansive compounds showed that in the presence of Ca(OH)2 and CaSO4 the tricalcium aluminate hydrated very slowly and the monocalcium aluminate quickly, whereas the calcium sulfoaluminate hydrated at a uniform rate during the early hydration period. Scanning micrographs are presented which show that ettringite formed in the presence of Ca(OH)2 is colloidal. It is proposed that colloidal ettringite can adsorb large quantities of water, thereby causing slump loss in fresh concrete and expansion in hardened concrete. (Author)

AD-767 531/7GA PC$2.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
POLYMER IMPREGNATED FIBROUS CELLULAR CONCRETE FOR BMD FACILITIES.
Technical rept.,
Eddie Price, and J. L. Lott. Jul 73, 23p Rept no. CERL-TR-M-31

Descriptors: (*Reinforced concrete, Impregnation), Reinforcing materials, Steel, Fibers, Foams, Polyester plastics, Styrene plastics, Structural properties, Composite materials.
Identifiers: Concrete polymer composites, Cellular concretes, Polymer impregnated fibrous cellular concretes.

The objective of the study was to evaluate the structural behavior of Polymer-impregnated, fibrous cellular concrete (PFCC) elements to see if further consideration of the use of such material systems is warranted for BMD facilities. A fibrous cellular concrete was impregnated with polyester resin to obtain polymer-impregnated, fibrous cellular concrete (PFCC) test specimens. Structural behavior was examined by testing simply supported beams; material behavior was determined by compression cylinder tests. Flexural behavior was evaluated based on the observed behavior of PFCC and steel reinforcing bars. (Modified author abstract)

BNL-50371/GA PC$3.50/MF$1.45
Brookhaven National Lab., Upton, N. Y.

COMPOSITE MATERIALS FOR RAILROAD APPLICATIONS. A FEASIBILITY STUDY FOR RENOVATING DETERIORATED WOODEN RAILROAD CROSSTIES.
M. Beller, and M. Steinberg. Feb 73, 29p

Descriptors: Composite materials, Monomers, Polymerization, Wood.

For abstract, see NSA 28 02, number 05003.

CONF-730425-1/GA PC$3.25/MF$1.45
Army Engineer Waterways Experiment Station, Vicksburg, Miss.
MULTIAXIAL CREEP IN CONCRETE.
J. E. McDonald. 1973, 22p
Contract AT(40-1)-3636

Descriptors: (*Concretes, *Creep), (*Pressure vessels, Concretes), Cements, Chert, Diagrams, Graywacke, Humidity, Limestone, Medium temperature, Stresses, Tensile properties, Testing.

For abstract, see NSA 28 03, number 06380.

PB-222 632/2GA PC$4.50/MF$1.45
Iowa State Univ., Ames. Engineering Research Inst.
EVALUATION OF GAP-GRADED ASPHALT CONCRETE MIXTURES. PART I. MECHANICAL PROPERTIES.
Final rept.,
Dah-Yinn Lee, Herbert T. David, and Richard W. Mensing. Jan 73, 135p* ISU-ER-AMES-72251-Pt-1
Paper copy also available from NTIS $9.00/set of 3 reports as PB-222 631-SET.

Descriptors: (*Bituminous concretes, Mechanical properties), Aggregates, Size determination, Particle size distribution, Bulk density, Highways, Performance evaluation, Wear resistance, Skid resistance.
Identifiers: Gap graded concretes, Gap graded aggregates.

The report presents the results of a comparative laboratory study between well- and gap-graded aggregates used in asphalt concrete paving mixtures. A total of 424 batches of asphalt concrete mixtures and 3,960 Marshall and Hveem specimens were examined. There is strong evidence from this investigation that, with proper combinations of aggregates and asphalts, both continuous- and gap-graded aggregates can produce mixtures of high density and of qualities meeting current design criteria. There is also reason to believe that the unqualified acceptance of some supposedly desirable, constant, mathematical relationship between adjacent particle sizes of the form such as Fuller's curve p = 100(d/D)to the nth power is not justified. It is recommended that the aggregate grading limits be relaxed or eliminated and that the acceptance or rejection of an aggregate for use in asphalt pavement be based on individual mixture evaluation. Furthermore, because of the potential attractiveness of gap-graded asphalt concrete in cost, quality, and skid and wear resistance, selected gap-graded mixtures are recommended for further tests both in the laboratory and in the field, especially in regard to ease of compaction and skid and wear resistance. (Author)

PB-222 633/0GA PC$3.50/MF$1.45
Iowa State Univ., Ames. Engineering Research Inst.
EVALUATION OF GAP-GRADED ASPHALT CONCRETE MIXTURES. PART II. STATISTICAL DESIGN AND ANALYSIS PART.
Final rept.,
Richard W. Mensing, Dah-Yinn Lee, and Herbert T. David. Feb 73, 63p ISU-ERI-AMES-72251-Pt-2
Paper copy also available from NTIS $9.00/set of 3 reports as PB-222 631-SET.

Descriptors: (*Bituminous concretes, Statistical analysis), Aggregates, Size determination, Particle size distribution, Bulk density, Performance evaluation, Wear resistance, Skid resistance, Highways.
Identifiers: Gap-graded concretes, Gap-graded aggregates.

The report presents the results of a comparative laboratory study between well- and gap-graded aggregates used in asphalt concrete paving mixtures. A total of 424 batches of asphalt concrete mixtures and 3,960 Marshall and Hveem specimens were examined. The main thrust of the statistical analysis conducted in this experiment was in the calibration study and in Part I of the experiment. In the former study, the compaction procedure between the Iowa State University Lab and the Iowa Highway Commission Lab was calibrated. By an analysis of the errors associated with the measurements the researchers were able to separate the 'preparation' and 'determination' errors for both laboratories as well as develop the calibration curve which describes the relationship between the compaction procedures at the two labs. (Modified author abstract)

PB-222 634/8GA PC$3.75/MF$1.45
Iowa State Univ., Ames. Engineering Research Inst.
EVALUATION OF GAP-GRADED ASPHALT CONCRETE MIXTURES. PART III: APPENDIX.
Final rept.,
Dah-Yinn Lee, Herbert T. David, and Richard W. Mensing. Jan 73, 77p ISU-ERI-AMES-72251-Pt-3
Paper copy also available from NTIS $9.00/set of 3 reports as PB-222 631-SET.

Descriptors: (*Bituminous concretes, Evaluation), Aggregates, Size determination, Particle size distribution, Bulk density, Performance evaluation, Highways, Wear resistance, Skid resistance.
Identifiers: Gap-graded concretes, Gap-graded aggregates.

The report contains the appendices to a comparative laboratory study between well- and gap-graded aggregates used in asphalt concrete paving mixtures. Topics discussed include: Aggregate sources and petrography; method for compacting Marshall specimens; method for determining the bulk specific gravity of compacted bituminous mixtures; mixing, compaction and testing procedures; indirect tensile test - procedure; laboratory compaction correlation; bituminous mix design data by Marshall method; bituminous mix design data by Hveem method.

PB-223 546/3GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
THE CHANGING MARKET FOR WOOD MATERIALS USED IN FARM STRUCTURES.
Forest Service research paper (Final),
David C. Baumgartner. Nov 71, 11p FSRP-NC-61

Descriptors: (*Wood products, *Market research), (*Farm buildings, Wood products), Construction, Wooden structures, Lumbering.

Commercial farm building construction in 17 Central and Appalachian states was studied to determine the number, size, and type of farm structures built during 1963-65, as well as information relating to the use and marketing of wood materials for such structures. Considerable substitution for lumber by other materials, both wood and nonwood, has occurred. Reasons for this decline in lumber use include changes in the type of buildings needed on modern farms, the increasing importance of farm building contractors who are capable of working with a wide range of materials, the form in which wood materials are marketed, and the sources from which they are purchased. Efforts to encourage more efficient use of wood in farm structures should be directed toward farm building contractors and manufacturers, and toward marketing wood in more convenient forms and locations.

13D. Containers and Packaging

AD-767 233/0GA PC$2.75/MF$1.45
Air Force Packaging Evaluation Agency Wright-Patterson AFB Ohio
COMPARISON OF CUSHIONING PROPERTIES OF 'MICROFOAM' AND 'KIMCEL' VERSUS 'AIR CAP' WRAP MATERIALS,
Richard V. Brown. Aug 73, 25p Rept no. DSPT-73-54

Descriptors: (*Packing materials, Cost effectiveness), (*Polymers, Packing materials), Creep, Drop testing, Stresses.

The purpose of this study was to evaluate various plastic wrap materials of foam sheet or flexible cellular structure to determine comparative cost-effectiveness of these materials for various protection levels and loading requirements. Peak 'G' versus Static Stress curves and creep data were developed and compared with like data abstracted from a previous study on a similar wrap material. The data collected in this study indicated that for the fragility levels and static stress regions considered, cost savings of 45 to 50% are possible by careful selection of the correct material. (Author)

N73-27781/6GA PC$3.00/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
FUNDAMENTAL RESEARCH ON STRESS WAVE EMISSION METHOD FOR PRESSURE VESSELS.
H. Hatano, R. Horiuchi, and N. Niwa. May 73, 11p ISAS-492

Descriptors: *Nondestructive tests, *Pressure vessels, *Stress waves, Emission spectra, Fatigue tests.

For abstract, see STAR 1118

N73-28889/6GA PC$17.25/MF$1.45
Boeing Aerospace Co., Seattle, Wash. Research and Engineering Div.
DEVELOPMENT OF A FRACTURE CONTROL METHOD FOR COMPOSITE TANKS WITH LOAD SHARING LINERS.
Interim Report, Jul. 1971 - Nov. 1972.
W. D. Bixler. Mar 73, 303p NASA-CR-120918, D180-15296-1
Contract NAS3-14380

Descriptors: *Composite structures, *Fracture mechanics, *Linings, *Load distribution (Forces), Aluminum, Stainless steels, Surface defects.

For abstract, see STAR 1119

PATENT-3 745 739/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPARATUS AND METHOD FOR SKIN PACKAGING ARTICLES.
Patent.
B. Madsen, E. R. Pozsony, and E. E. Collin.
Patented 17 Jul 73, 22p NASA-CASE-MFS-20855, Misc-Filed 24 Mar. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Materials handling, *Packaging, *Plastic coatings, *Polymeric films, Patents, Product development, Systems engineering.

A system for skin packaging articles including a loading zone for positioning articles to be packaged upon a substrate, a thermoplastic film heating and vacuum operated skin packaging zone for covering the articles with film laminated to the substrate and a slitting zone for separating and trimming the individual skin packaged articles. The articles are passed to the successive zones. The loading zone may be adapted for con-

veyorized instead of hand loading. In some cases, where only transverse cutting of the film web is necessary, it may be desirable to eliminate the slitting zone and remove the skin packaged article or articles directly from the packaging zone. A conveniently located operating panel contains controls for effecting automatic, semiautomatic or manual operation of the entire system of any portions in any manner desired.

13E. Couplings, Fittings, Fasteners, and Joints

BDX-613-716(Rev.)/GA PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo.
QUALIFICATION OF MINIATURE INTERNAL THREADS USING AIR FLOW.
C. W. Jr. Berry. Apr 73, 23p
Contract AT(29-1)-613

Descriptors: (*Fasteners, *Standards), Air, Machine parts, Openings, Pressure gages, Testing.

For abstract, see NSA 28 03, number 07656.

N73-27456/5GA PC$3.50/MF$1.45
Rolls-Royce, Ltd., Leavesden (England). Small Engine Div.
PROPERTIES OF ELECTRON BEAM WELDMENTS IN 2 1/2 PERCENT NI-CR-MO STEEL AND 18 PERCENT NI-CO-MO MARAGING STEEL.
A. E. Longley. 1971, 28p S/T-MEMO-9-71, BR25369
Contract KS/1/0496/C.B.43(A)2

Descriptors: *Fatigue tests, *Heat treatment, *High strength steels, *Welded joints, Aircraft structures, Ductility, Electron beams, Maraging steels, Materials science, Tensile strength, Thermal cycling tests.

For abstract, see STAR 1118

ZJE-135/GA PC$3.00/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
METHODS OF DETERMINING TRIAXIAL INITIAL STRESSES IN WELDS.
I. Kupka. 1972, 14p
U.S. Sales Only.

Descriptors: (*Welded joints, *Stresses), Distribution, Embrittlement, Measuring methods, Thickness.

For abstract, see NSA 28 03, number 07831.

13F. Ground Transportation Equipment

AD-767 634/9GA PC$3.00/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
VIBRATORY LOCOMOTION.
Technical note,
H. A. Gaberson, and P. L. Stone. Jul 73, 39p Rept no. NCEL-TN-1292

Descriptors: (*Surface propulsion, Vibration), (*Vehicles, *Vibrators(Mechanical)), Oscillation, Design, Equations of motion, Friction, Propulsion.
Identifiers: Vibratory locomotion.

A new method for accomplishing land locomotion by vibrating a mass attached to a skid has been developed. The mass oscillates in an inclined direction, upward and forward, downward and backward. On the up-forward stroke it lifts the skid and pulls it forward; on the down-backward stroke it pushed the skid into the ground and the increased friction inhibits backslide. The report presents the essentials of the theory of operation, design chart, and reports on experiments with test skids. (Author)

N73-27799/8GA PC$6.00/MF$1.45
Michigan Univ., Ann Arbor. Tire and Suspension Systems Research Group.
PRELIMINARY MEASUREMENTS ON HEAT BALANCE IN PNEUMATIC TIRES.
G. H. Nybakken, D. Y. Collart, R. J. Staples, J. I. Lackey, and S. K. Clark. Jul 73, 80p NASA-CR-121239, REPT-036390-2-T
Contract NGR-23-005-417

Descriptors: *Heat balance, *Pneumatics, *Tires, Friction, Hysteresis, Temperature measurement.

For abstract, see STAR 1118

PB-223 237/9GA PC$7.00/MF$1.45
Ford Motor Co., Dearborn, Mich. Transportation Research and Planning Office.
PRELIMINARY DESIGN STUDIES OF MAGNETIC SUSPENSIONS FOR HIGH SPEED GROUND TRANSPORTATION.
Final rept. on Tasks 2/3, Feb 72-Mar 73,
John R. Reitz, Robert H. Borcherts, L. C. Davis, T. K. Hunt, and Dennis F. Wilkie. Mar 73, 314p* FRA-RT-73-27
Contract DOT-FR-10026

Descriptors: (*Electromagnets, Experimental design), (*Rapid transit railways, *Suspension systems(Vehicles)), Electromagnetic fields, Superconducting magnets, Superconductivity, Induction motors, Aerodynamic forces, Railroad cars, Equipment specifications.
Identifiers: *Magnetic levitation, *Magnetic suspension, Guideways.

The report examines certain critical problem areas relative to magnetic suspension of high-speed vehicles and develops a baseline design for a TMLRV (tracked magnetically levitated research vehicle). Both types of magnetic suspension, the repulsive-force suspension and the attractive-force suspension, are considered. The present study has not turned up any problems serious enough to completely eliminate one of these competing suspensions. Areas considered in the report include propulsion systems and their compatibility with magnetically-levitated high-speed vehicles, aerodynamic effects, fairlure modes, studies of ride quality, and criteria for maximum allowable track roughness. In regard to the repulsive-force suspension, experiments have been carried out to measure ac loss in the superconducting magnets and an assessment of the magnetic shielding requirement has been made. Two model electromagnets for the attractive-force suspension, and their feedback control systems, were built and tested during the present study.

PB-223 656/0GA PC$4.75/MF$1.45
Calspan Corp., Buffalo, N.Y.
BASIC RESEARCH IN CRASHWORTHINESS II.
Final rept. Jul 70-May 73,
Patrick M. Miller. Jun 73, 158p* CALSPAN-YB-2987-V-21 DOT-HS-800 887
Contract FH-11-7622
See also report dated Jul 73, PB-222 589.

Descriptors: (*Automobiles, *Crash tests), (*Safety engineering, Automobiles), Structural properties, Steering gear, Safety belts, Safety devices, Dyanmic tests, Impact tests, Collision research, Design standards.
Identifiers: *Crashworthiness.

Results obtained on the major research program 'Crashworthiness II,' are summarized. The program was constituted as eleven different work items or tasks and performed during the period July 1970 to May 1973. Specific results obtained from each task have been fully documented in a series of twenty interim reports issued during the course of the study. A crashworthy design suitable for typical full size automobiles to provide protection during front, side and rollover collisions was developed. Modified front structures for a wider class of vehicle type; namely, luxury, compact and subcompact automobiles were also developed. In all instances, test results from these modified vehicles were compared to similar data for conventional (unmodified) automobiles. Generally, the structural modifications resulted in considerable reduction in passenger compartment intrusions while maximum decelerations were nominally unchanged. Structural automotive design elements included consideration of steering column assembly, crash detection and state-of-the-art occupant restraint systems. Areas where improvements are needed were identified. An analogue/digital data acquisition and reduction system was developed and used extensively within the program. Analytical methods for analyzing frame structures undergoing dynamic impact with fixed objects were developed for both two and three-dimensional frame structures. The analysis includes effects of large deformation, material rate-sensitivity and workhardening on dynamic structural performance.

PB-223 710/5GA PC$3.25/MF$1.45
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION. SECTION K006, VIENNA ROUTE WEST CHURCH STATION.
Rept. no. 8.
26 Sep 73, 25p MRWJ-73-92
Sponsored in part by Washington Metropolitan Area Transit Authority.

Descriptors: (*Subway railways, *District of Columbia), (*Railroad stations, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, *West Church Station, *Vienna Route, Design Section K006.

Results of 23 borings made in Section K006 of Vienna Route of the Washington Metropolitan Area Metro System at the location of West Falls Church Station and its parking lot and ancillary structures are described. The investigation was made to determine subsurface conditions in connection with design and construction of the station complex. The report contains several geological sections through the various borings, logs of the borings, results of laboratory testing of the subsoils, conclusions regarding subsoil properties and a summary of anticipated design and construction problems.

PB-223 721/2GA PC$5.75/MF$1.45
Ultrasystems, Inc., Newport Beach, Calif.
SAFETY STATUS OF VEHICLES-IN-USE STUDY.
Final rept. Jan 72-Mar 73,
F. G. Fisher, Jr., P. Biche, and R. Eidemiller. Aug 73, 233p* US-8209-2-F DOT-HS-800 898
Contract DOT-HS-094-2-253

Descriptors: (*Motor vehicles, Inspection), (*Safety, Motor vehicles), Surveys, Deterioration, Defects, Steering, Braking, Test equipment, Data processing, Connecticut, Missouri, Alabama, Arizona, Washington(State), Illinois.
Identifiers: Motor vehicle diagnostic centers.

The study was conducted to determine the safety status of automobiles in-use on the U.S. highways. The data collected indicated that age is a very critical factor with respect to the number of 'out of specification conditions' found on vehicles. Also, the results indicate that vehicles in States with rigorous PMVI systems are in significantly better condition than vehicles in States with random MVI or no MVI. The component test criteria was modified to make it more objective by assigning

levels of defectiveness where appropriate. The existing vehiclesin-use computer software was redesigned to make it more general and provide it with certain added capabilities such as the inclusion of all vehicle specifications necessary for the automobiles on the U.S. highways. A diagnostic equipment correlation study was made on the various name brands of brake testers and front-end geometry equipment that are normally found in the diagnostic centers utilized for studies of this type.

PB-223 723/8GA PC$3.50/MF$1.45
Gilman (W. C.) and Co., Inc., Chicago, Ill.
AN INNOVATIVE MARKETING PROGRAM FOR COTA (CENTRAL OHIO TRANSIT AUTHORITY).
Final rept.
Oct 72, 71p* UMTA-OH-09-0011-72-1
Prepared by Central Ohio Transit Authority. Prepared in cooperation with Garver (Robert I.) and Associates, York, Pa.

Descriptors: (*Bus lines, *Market research), (*Mass transportation, *Ohio), Buses(Vehicles), Design, Shelters, Passenger terminals, Public relations, Sales, Promoting, Publicity, Marketing, Surveys.

The report concerns a marketing program which was developed especially for the Central Ohio Transit Authority (COTA). It covers marketing functions; marketing research; design of vehicles, stops, shelters, and information aids; public relations; sales promotion; customer relations; market development; and advertising. The program is integrated and covers specific implementation details during a period of one year. The basic purpose of the study is to develop a comprehensive marketing program, suitable for immediate implementation, aimed at increasing the use of transit. Transit marketing is stressed as a function composed of the many facets listed above, but importance is also placed on the concept that the importance of marketing in the transit enterprise is integrating all the parts of the operation in order to meet the goal of good quality public service.

PB-223 729/5GA PC$3.50/MF$1.45
Calspan Corp., Buffalo, N.Y.
DEVELOPMENT OF COMPLIANCE TEST PROCEDURES FOR FEDERAL MOTOR VEHICLE SAFETY STANDARD 215--EXTERIOR PROTECTION--PASSENGER CARS.
Final rept. 28 Jun-30 Jul 73,
R. H. Arendt, R. J. Cassidy, and D. T. Tunkel. Sep 73, 73p CALSPAN-ZP-5353-K-1 DOT-HS-800 918
Contract DOT-HS-053-3-768

Descriptors: (*Bumpers, Impact tests), (*Safety engineering, *Automobiles), Stiffness, Structural properties, Design standards, Collision research, Pendulums, Test equipment.

The primary purpose of the program was to investigate the lateral and torsional stiffness characteristics of the Calspan Corporation Pendulum Test Device (PTD). The static stiffness measurements were made (before and after pendulum modification). Several pendulum impact tests were performed (before and after pendulum modification) on a 1973 Ford Galaxie bumper guard with various degrees of pendulum bumper guard centerline offset. The bumper impact tests were documented on high speed film.

PB-223 735/2GA PC$4.25/MF$1.45
National Urban League, New York.
MARKETING TECHNIQUES AND THE MASS TRANSIT SYSTEM.
Final rept.
Jul 73, 107p* UMTA-DC-06-0020-73-1
Contract DOT-UT-533
Prepared in cooperation with Mark Battle Associates, Inc., Washington, D.C. See also PB-223 736.

Descriptors: (*Urban transportation, *Marketing), Market research, Prices, Product development, Promoting, Public relations, Mathematical models, Management planning.

The report, a transit information and marketing study, was performed with two objectives in mind: To identify marketing and information techniques being used successfully by mass transit systems to increase patronage and to make their systems more accessible to the public; and to develop a model for evaluating transit information and marketing systems and to develop methods to increase the effectiveness of these systems. Three methods were used to gather the information in the report: a literature search, a written questionnaire to transit systems, and visits to five cities for personal interviews with transit system officials. The main problems are found to be competition with other transit modes (especially automobiles), increasing costs, and communications barriers between the transit service and the public. Recommendations are made and areas where further work and research may be useful are suggested. A companion handbook to the report includes specific examples of advertisements and promotional pamphlets for use by all media.

PB-223 736/0GA PC$4.25/MF$1.45
National Urban League, New York.
MARKETING TECHNIQUES AND THE MASS TRANSIT SYSTEM - A HANDBOOK.
Jul 73, 122p* UMTA-DC-06-0020-73-2
Contract DOT-UT-533
Prepared in cooperation with Mark Battle Associates, Inc., Washington, D.C. Supplement to PB-223 735.

Descriptors: (*Urban transportation, *Marketing), Manuals, Market research, Promoting, Publicity, News media, Public relations.

The handbook contains a selection of materials that have been used by transit systems to promote their service or to provide the public with information about using their service. The samples represent some of the more creative pieces that were provided by the 58 transit systems covered in the research on the companion report, 'Marketing Techniques and Mass Transit Systems'. The volume is designed as a guide to aid other transit systems in the selection of materials for their own marketing campaigns. Contents include pamphlets on video reinforcement, newspaper advertisements on rider reinforcement, encouraging modal switch and notices of systems changes, special information tools, schedules, maps, news releases, radio-spot advertising, multi-lingual announcements and announcements of special public relations activities. The format is largely graphic. Portions of this document are not fully legible.

PB-223 981/2GA PC$3.25/MF$1.45
Muesser, Rutledge, Wentworth and Johnson, New York.
SUBSURFACE INVESTIGATION. SECTION D011. NEW CARROLLTON ROUTE STORAGE YARD.
Rept. no. 1.
28 Sep 73, 22p MRWJ-73-93
Sponsored in part by Washington Metropolitan Area Transit Authority.

Descriptors: (*Subway railways, *District of Columbia), (*Routes, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, *New Carrollton route, Design section D011. *New Carrollton route storage yard.

Results of four borings made in the planned storage yard in Section D011 of New Carrollton Route near the intersection of Penn Central Railroad with the I-495 Beltway in Prince Georges County, Maryland, are summarized. The investigation supplemented an earlier one contained in MRW and J Report No. 86 and was to provide additional information in planning the storage yard facilities. The report contains geological sections through the borings, logs of the borings, results of laboratory identification tests, conclusions regarding subsoil properties and a summary of anticipated design and construction problems. This investigation is for the Washington Metropolitan Area Metro system.

13G. Hydraulic and Pneumatic Equipment

AD-767 243/9GA PC$4.50/MF$1.45
Systems Associates Inc Long Beach Calif
U. S. ARMY HELICOPTER HYDRAULIC SERVOCYLINDER RELIABILITY AND MAINTAINABILITY INVESTIGATION.
Final rept.,
James L. Huffman, and Sheldon Dockswell. May 73, 147p Rept no. SAI-R73-009 USAAMRDL-TR-73-29
Contract DAAJ02-71-D-0003

Descriptors: (*Hydraulic actuators, Maintainability), (*Helicopters, *Flight control systems), Logistics, Maintenance, Spare parts, Value engineering, Hydraulic servomechanisms, Hydraulic valves, Failure(Mechanics).
Identifiers: Logistics management, Failure analysis.

The report describes an investigation carried out to identify, isolate, and verify the causes of problems with hydraulic servocylinder actuators used on U.S. Army helicopters, and to trace the resulting effects on helicopter availability. Design requirements, quality assurance provisions, maintenance procedures and practices were analyzed to assess their impact upon the current problems. The analysis of the pertinent failure data and documentation revealed that five failure modes were responsible for over 90% of the total hydraulic servocylinder removals in a 6 1/2-year period. Subsequent analysis of the various policies, practices and procedures showed that these documents contain anomalies that contribute to the occurrence of the five predominant failure modes. The lack of stringent basic design requirements, quality control, and adequate maintenance manuals was shown to be a major contributor to the leaking failure mode. This mode accounts for approximately half of the servocylinder removals from U.S. Army helicopters. (Author)

AD-767 255/3GA PC$3.00/MF$1.45
Harry Diamond Labs Washington D C
FLUERICS 35. JET DYNAMICS AND ITS APPLICATION TO THE BEAM-DEFLECTION AMPLIFIER,
Joseph M. Kirshner. Jul 73, 40p Rept no. HDL-TR-1630

Descriptors: (*Fluid amplifiers, Fluid dynamic properties), Fluidics, Fluid flow, Flow separation, Deflection, Pressure, Transfer functions.
Identifiers: Proportional amplifiers, Fluerics, Beam deflection amplifiers.

The report shows how the response of a jet to a pressure gradient is used to derive the impedance of the jet. The results are used to obtain the transfer function, for the variation of the output pressure with variation of input pressure, for a beam-deflection amplifier, including the effects of the vent and of output loading. The input impedance is shown in general, to depend upon the vent and output impedances. (Author)

AD-767 615/8GA PC$4.50/MF$1.45
General Electric Co Cincinnati Ohio Aircraft Engine Group

AN EXPERIMENTAL EVALUATION OF UNSTEADY FLOW EFFECTS ON AN AXIAL COMPRESSOR. P3 GENERATOR PROGRAM.
Final rept. 1 Jul 72-1 Jul 73,
G. G. Reynolds, W. F. Vier, and T. P. Collins. Jul 73, 145p Rept no. R73AEG309 AFAPL-TR-73-43
Contract F33615-73-C-2001

Descriptors: (*Axial-flow compressors, Flow fields), Duct inlets, Aerodynamic characteristics, Interactions, Data processing systems, Compressor parts, Experimental data.
Identifiers: Dynamic response.

A test program has been successfully completed to obtain fundamental information concerning the behavior of a fan compressor unit when subjected to planar pressure and flow pulses. Testing was conducted at two corrected fan speeds over a range of input pressure amplitudes and frequencies. A total of 24 fan surges and approximately fifty-seven 'steady-state' data points were obtained. The General Electric developed Planar Pressure Pulse Generator (P3G) was used to produce a sinusoidal type pressure disturbance to a current technology two-stage fan inlet. A thorough complement of dynamic instrumentation, consisting of approximately 45 transducers, was utilized throughout the testing. Data reduction is complete and several fundamental results have been obtained. (Author)

N73-27418/5GA PC$10.25/MF$1.45
Hydraulic Research and Mfg. Co., Valencia, Calif.
ACTIVE-STANDBY SERVOVALUE/ACTUATOR DEVELOPMENT.
Final Report.
R. K. Masm. 30 May 73, 163p NASA-CR-124299, HR-73700068
Contract NAS8-27838

Descriptors: *Hydraulic equipment, *In-flight monitoring, *Rocket engines, *Space shuttles, Actuation, Electronic equipment, Failure modes, Valves.

For abstract, see STAR 1118

13H. Industrial Processes

AD-767 036/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHODS FOR JOINING GRAPHITE PRODUCTS,
N. A. Olshanskii, and F. B. Shubin. 5 Sep 73, 5p Rept no. FTD-HT-23-242-74
Edited trans. of Patent (USSR) 199 116 p1, 13 Jul 67, by Victor Mesenzeff.

Descriptors: (*Thermal joining, *Graphite), Hydrocarbons, Heating, USSR, Patents.
Identifiers: Translations.

A method is proposed for joining graphite products in melted or liquid hydrocarbons (paraffin, alcohol, mineral oils, and others). The connection points are heated to high temperatures by high-frequency currents, induction currents, arc discharge and other heat sources. As the liquid or melted hydrocarbons come in contact with the heated surface of the graphite or carbon part, the liquid hydrocarbons dissociate with the liberation of carbon on the part, which provides a tight and strong connection between the two graphite parts without disturbing the homogeneity of the properties of the entire graphite product.

AD-767 045/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PRODUCTION OF HEMISPHERES ON SHEET-METAL DROP-FORGING HAMMERS,
M. I. Razumikhin, Yu. B. Drobot, R. M. Belyashev, and Yu. I. Bolotin. 19 Sep 73, 9p Rept no. FTD-HT-23-190-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p120-123 1971, by Charles T. Ostertag, Jr.

Descriptors: (*Mechanical working, Hemispherical shells), Sheets, Machine tools, USSR.
Identifiers: Translations, Drop hammers, Forging hammers, *Stamping.

The investigation showed that the single-transition reverse stamping of hemispheres of specific thicknesses and diameters can be performed successfully on sheet-metal drop-forging hammers.

AD-767 324/7GA PC$6.25/MF$1.45
Naval Ordnance Station Louisville Ky
THE DEVELOPMENT OF RATIONAL TECHNIQUES FOR THE UTILIZATION OF ELECTROCHEMICAL MACHINING.
Final rept. on Phase 1,
J. F. Thorpe, R. D. Zerkle, and F. Fluerenbrock. Jul 73, 268p* Rept no. NOSL-MT-019

Descriptors: (*Machining, Electrochemistry), Electrolytes, Numerical analysis, Computer programs.
Identifiers: *Electrochemical machining.

Some sixty-two machining tests were conducted with the test device in a production ECM machine, the results of which were numerically analyzed and compared with the theoretical equations. The theory was modified and computer programs written to analyze the mathematical formulation; test computations were performed to verify their accuracy. A computer program has been written so that the rectilinear equilibrium gap can be predicted. (Modified author abstract)

BDX-613-824(Rev.)/GA PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo.
CREATION OF LARGE CASTINGS BY THE INVESTMENT PROCESS. FINAL REPORT.
W. E. Cromwell. Mar 73, 21p
Contract AT(29-1)-613

Descriptors: (*Aluminium alloys, *Casting), Design, Dimensions, Fabrication, Thickness.

For abstract, see NSA 28 02, number 03152.

BDX-613-863/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
HOLE FINISH CONTROL IN 4330 VANADIUM MODIFIED STEEL. FINAL REPORT.
D. A. Mitchell. Mar 73, 13p
Contract AT(29-1)-613

Descriptors: (*Vanadium alloys, *Machining), Apertures, Control, Dimensions, Inspection, Production, Steels.

For abstract, see NSA 28 02, number 03153.

BDX-613-868/GA PC$3.25/MF$1.45
Bendix Corp., Kansas City, Mo.
DEEP DRAWN STAINLESS STEEL COVERS. TECHNOLOGICAL SPINOFF REPORT.
R. E. Mitchell. Mar 73, 21p
Contract AT(29-1)-613

Descriptors: (*Stainless steels, *Drawing), Canning, Design, Fabrication, Hydraulics, Presses.

For abstract, see NSA 28 02, number 03154.

CONF-730606-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ADVANCES IN ELECTRODISCHARGE MACHINING OF REFERENCE FLAWS.
K. V. Cook, R. W. McClung, and H. L. Whaley. 1973, 6p
Descriptors: (*Spark machining, Nondestructive testing), (*Nondestructive testing, *Calibration standards), Defects, Electric discharges, Electrodes.

For abstract, see NSA 28 03, number 05479.

DUN-8097/GA PC$4.00/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
MANUFACTURING PROCESS TECHNIQUES FOR ON-SITE COMPONENT FABRICATION.
4 Dec 72, 38p

Descriptors: (*Copper alloys, *Machining), (*Silicon alloys, Machining), (*Zircaloy-2, Machining), (*Nuclear fuels, Machining), Coatings, Configuration, Dies, Fabrication, Graphite, Spacers, Specifications, Thickness, Uranium, Casting, Plates, Shells.

For abstract, see NSA 28 03, number 06224.

NAA-SR-Memo-7241/GA PC$4.25/MF$1.45
Atomics International, Canoga Park, Calif.
HIGH TEMPERATURE ULTRA-HIGH VACUUM SELF-WELD TESTING. INTERIM REPORT.
L. G. Kellogg. 28 Mar 62, 41p
Contract AT(11-1)-GEN-8

Descriptors: (*Aluminium oxides, *Adhesion), (*Stainless steel-316, Adhesion), (*Inconel alloys, Adhesion), (*Alloy-a-286, Adhesion), Bonding, High temperature, Pressure dependence, Testing, Welding, Beryllium, Beryllium oxides, Beryllium alloys.

For abstract, see NSA 28 03, number 06276.

N73-27408/6GA PC$14.50/MF$1.45
General Dynamics/Convair, San Diego, Calif.
DEVELOPMENT OF FORMING AND JOINING TECHNOLOGY FOR TD-NICR SHEET.
Contractor Report, Jun. 1971 - Mar. 1973.
R. T. Torgerson. Apr 73, 248p NASA-CR-121224
Contract NAS3-15567

Descriptors: *Forming techniques, *Nickel alloys, *Weld tests, Recrystallization, Tensile properties, Thermal protection.

For abstract, see STAR 1118

N73-27420/1GA PC$7.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
DETECTION OF LACK OF FUSION USING OPAQUE ADDITIVES.
Final Report, 2 Jun. 1972 - 30 Apr. 1973.
J. L. Cook. 30 Apr 73, 99p NASA-CR-124332, MDC-G4538
Contract NAS8-28708

Descriptors: *Aluminum, *Metallography, *Microstructure, *Nondestructive tests, *Spacecraft structures, *Welded joints, Failure analysis, Quality control, Weld strength, Weld tests.

For abstract, see STAR 1118

N73-27454/0GA PC$5.25/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
CHEMICAL METAL MACHINING FOR PERFECTION OF AN INDUSTRIAL MANUFACTURING METHOD ETUDE DE L'USINAGE DES METAUX PAR VOIE CHIMIQUE EN VUE DE METTRE AU POINT UNE METHODE INDUSTRIELLE DE FABRICATION RAPPORT FINAL.
Final Report.
C. Lyon. 6 Dec 71, 62p
Contract DGRST-69-02-055-00-275-01
Language in French.

Descriptors: *Chemical machining, *Manufacturing, *Steels, *Technology utilization, Chemical attack, Metal surfaces, Photographic developers, Photosensitivity, Resins, Surface finishing.

For abstract, see STAR 1118

N73-28530/6GA PC$6.50/MF$1.45
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
STUDY OF GAS TUNGSTEN ARC WELDING PROCEDURES FOR TANTALUM ALLOY T-111 (TA-8 W-2HF) PLATE.
Final Report, 1971 - 1972.
R. E. Gold, and R. L. Kesterson. May 73, 86p
NASA-CR-121198, WANL-M-FR-72-011
Contract NAS3-15555

Descriptors: *Arc welding, *Cracking (Fracturing), *Gas welding, *Metal matrix composites, *Tantalum alloys, Mechanical properties, Metallography, Refractory metals.

For abstract, see STAR 1119

PATENT-3 745 300/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
WELDING BLADES TO ROTORS.
Patent.
K. H. Hoklo, and T. J. Moore. Patented 10 Jul 73, 5p NASA-CASE-LEW-10533-1,
Misc-Filed 15 Apr. 1971 Supersedes N71-34423 (09 - 21, p 3433).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Compressor blades, *Electric welding, *Jet engines, *Rotors, *Turbine blades, Cost reduction, Patents, Production engineering, Welded joints.

A process is described to form T-joints between dissimilar thickness parts by magnetic force upset welding. This type of resistance welding is used to join compressor and turbine parts which thereby reduces the weight and cost of jet engines.

PB-223 626/3GA PC$6.50/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Fuels Research Lab.
DESIGN AND CONTROL OF INCINERATORS. VOLUME I.
Final rept.,
A. F. Sarofim, G. C. Williams, J. B. Howard, and J. E. L. Rogers. Sep 73, 299p* EPA-670/2-73-089A
Grant PHS-EC-00330
See also Volume 2, PB-223 627.

Descriptors: (*Solid waste disposal, Incinerators), (*Incinerators, Design), Combustion, Burning rate, Combustion control, Refuse disposal, Mathematical models, Combustion products, Temperature, Moisture content, Ignition.
Identifiers: Pyrolysis incineration.

The report describes a versatile batch incinerator that was designed and built in order to determine the effect of operational variables on the ignition and burning rates in a fuel bed under conditions similar to those encountered in municipal incinerators. Detailed concentration and temperature profiles within and above the fuel bed were obtained for different distributions of overfire and underfire air rates. These results were used to evaluate both the rate controlling processes and control strategies. It was concluded that for the synthetic refuse beds studied, internal diffusion within the burning elements was limiting and that drying, pyrolysis, and gasification were contemporaneous through most of the runs giving rise to burning rates and overfire gas compositions that were constant over most of a run. From the oxygen concentrations in the bed, it is concluded that low underfire air rates are desirable early and late in a burn, and that for a fully ignited bed the maximum air rate is determined more by consideration of ash carryover and channelling than by the bed's ability to consume the oxygen. (Modified author abstract)

PB-223 627/1GA PC$4.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Fuels Research Lab.
DESIGN AND CONTROL OF INCINERATORS. VOLUME II. APPENDICES.
Final rept.,
A. F. Sarofim, G. C. Williams, J. B. Howard, and J. E. L. Rogers. Sep 73, 153p EPA-670/2-73-089B
Grant PHS-EC-00330
See also Volume 1, PB-223 626.

Descriptors: (*Solid waste disposal, *Incinerators), (*Urban planning, Incinerators), Heat loss, Computer programs, Least squares method, Statistical analysis, Thermal conductivity, Carbon monoxide, Weight measurement, Heat transmission, Burning rate, Combustion products, Ignition, Design.
Identifiers: Pyrolysis incineration, Computer aided analysis.

Volume II of this report describes a versatile batch incinerator that was designed and built in order to determine the operational variables in a fuel bed under similar conditions to those encountered in municipal fuel beds. Detailed operating instructions are provided. A numerical analysis of heat loss through the fuel bed wall is given. The fuel bed weighing system, its calibration and statistical analysis is presented. A computer program for the data in this work is described.

PB-223 681/8GA PC$3.25/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
PROVISIONAL SPECIFICATION OF THE DESIGN OF FUNCTIONAL MAINTENANCE MANUALS.
Aug 73, 25p BISRA-SP/ST/TD/0054/1/73/C

Descriptors: (*Maintenance, Manuals), Industrial engineering, Specifications, Great Britain.

The specification sets out the requirements of the British Steel Corporation, Special Steels Division for maintenance manuals to be supplied with electronic, hydraulic, pneumatic, electrical and mechanical equipment, and plant when this is required in functional form. It is based upon the functional concept developed by the Royal Navy and is described in detail in their 'New Guide to F.I.M.S.', 2nd edition. Suppliers are referred to this document for more detailed guidance on the construction of functional diagrams.

PB-223 697/4GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
COMMISSIONING OF STEELWORKS PLANT - A LITERATURE SURVEY AND BIBLIOGRAPHY.
Technical note,
D. G. Brinn. Aug 73, 16p BISRA-SM/TN/1/31

Descriptors: (*Steel plants, Industrial engineering), Starting, Surveys, Bibliographies, Great Britain, Metal rolling, Continuous casting, Automatic control, Steel making.

The literature on the commissioning of steelworks plant is reviewed under the headings - Coke Ovens, Blast Furnace, Steelmaking, Continuous Casting, Rolling and Finishing, Personnel Training and General References. An annotated bibliography consisting of 70 references on the subject is appended.

PB-223 720/4GA PC$4.50/MF$1.45
Illinois Inst. for Environmental Quality, Chicago.
CATALOG OF SOLID WASTE LITERATURE.
Final rept.,
May 73, 48p IIEQ-73-3

Descriptors: (*Solid waste disposal, *Bibliographies), Refuse, Industrial wastes, Refuse disposal, Organic wastes, Illinois.

This is a catalog of solid waste literature held by two libraries in the state of Illinois--the library of the Institute for Environmental Quality in Chicago and the State Library in Springfield. The catalog will be expanded into a large union book catalog covering a wide range of environmental subjects, and will include holdings from several libraries in the State.

PB-223 732/9GA PC$3.50/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
BIBLIOGRAPHY OF ELECTRICAL INTERFERENCE IN INSTRUMENT AND CONTROL ENGINEERING.
A.M. Healey. Aug 73, 66p* BISRA-INF/1/73

Descriptors: (*Electromagnetic interference, Bibliographies), (*Instruments, Electromagnetic interference), (*Control equipment, Electromagnetic interference), Production engineering, Great Britain.

The bibliography contains 297 selected references to work published during the last seven years on various aspects of electrical interference, which are relevant to instrumentation and control engineering in the process industries. Aspects included are sources and occurrence; effects on systems and instruments; measurement and prediction; and techniques for control of interference. The fields of radio and communications engineering are excluded.

SCL-DR-720090/GA PC$3.50/MF$1.45
Sandia Labs., Livermore, Calif.
HIGH STRENGTH NICKEL--COBALT DEPOSITS FOR ELECTROJOINING APPLICATIONS.
J. W. Dini, H. R. Johnson, and J. R. Helms. Mar 73, 30p
Contract AT(29-1)-789

Descriptors: (*Nickel alloys, Joints), (*Cobalt alloys, Joints), (*Joints, *Mechanical properties), Electroplating, Joining, Stresses, Temperature dependence, Yield strength.

For abstract, see NSA 28 02, number 05066.

UCID-16241/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
DETERMINATION OF GOLD IN ELECTROPLATING SOLUTIONS BY CONTROLLED-POTENTIAL COULOMETRY.
J. E. Harrar, and M. C. Waggoner. 2 Apr 73, 11p
Contract W-7405-eng-48

Descriptors: (*Gold, *Voltametry), (*Electroplating, *Chemical analysis), Quantitative chemical analysis, Solutions.

For abstract, see NSA 28 03, number 07804.

13I. Machinery and Tools

DUN-8099/GA PC$3.00/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
PROCEDURE FOR CONTROLLING THE PRESSURES USED ON EXTRUSION PRESS TOOLING.
12 Jan 73, 5p

Descriptors: (*Extrusion, *Safety standards), Dies, Failures, Hydraulics, Operation, Personnel, Presses, Pressure dependence, Reliability, Safety, Specifications, Valves.

For abstract, see NSA 28 03, number 05453.

N73-27409/4GA PC$7.00/MF$1.45
General Electric Co., Evendale, Ohio. Aircraft Engine Group.
THE DEVELOPMENT AND PRODUCTION OF THERMO-MECHANICALLY FORGED TOOL STEEL SPUR GEARS.
E. N. Bamberger. Jul 73, 99p NASA-CR-121227, R73AEG284
Contract NAS3-15338

Descriptors: *Forging, *Gear teeth, *Gears, *Metal working, Mechanical properties, Product development, Thermodynamic properties.

For abstract, see STAR 1118

N73-27410/2GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CORRELATION OF MAGNETIC PERTURBATION INSPECTION DATA WITH ROLLING ELEMENT BEARING FATIGUE RESULTS.
R. J. Parker. 1973, 27p NASA-TM-X-68260, E-7549
Conf-Proposed for Presentation at Joint Lubrication Conf., Atlanta, 16-18 Oct. 1973; Cosponsored by AM. Soc. Of Lubrication Engr. And Asme.

Descriptors: *Ball bearings, *Magnetic effects, *Microstructure, *Nondestructive tests, Accelerated life tests, Fatigue (Materials), Magnetic anomalies.

For abstract, see STAR 1118

N73-27412/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF HIGH SPEED BALL BEARINGS WITH LEAD AND LEAD ALLOY PLATED RETAINERS IN LIQUID HYDROGEN AT 1.2 MILLION DN.
D. E. Brewe, H. W. Scibbe, and D. W. Wisander. 1973, 25p NASA-TM-X-68268, E-7573
Conf-Proposed for Presentation of Joint Lubrication Conf., Atlanta, 16-18 Oct. 1973; Cosponsored by AM. Soc. Of Lubrication Engr. And Asme.

Descriptors: *Ball bearings, *Loads (Forces), *Lubrication, *Thrust loads, Liquid hydrogen, Low temperature environments, Reliability analysis, Service life.

For abstract, see STAR 1118

N73-27413/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A LIFE STUDY OF AISI M-50 AND SUPER NITRALLOY SPUR GEARS WITH AND WITHOUT TIP RELIEF.
D. P. Townsend, and E. V. Zaretsky. 1973, 23p NASA-TM-X-68269, E-7575
Conf-Proposed for Presentation at Joint Lubrication Conf., Atlanta, Ga., 16-18 Oct. 1973; Sponsored by AM. Soc. Of Lubrication Engr. And the Asme.

Descriptors: *Gears, *High strength steels, *Materials tests, *Service life, Accelerated life tests, Failure analysis, Product development, Temperature effects.

For abstract, see STAR 1118

N73-28529/8GA PC$3.00/MF$1.45
Ampex Corp., Redwood City, Calif.
DESIGN, FABRICATION, AND PERFORMANCE OF FOIL JOURNAL BEARING FOR THE BRAYTON ROTATING UNIT.
L. Licht, and M. Branger. Jul 73, 111p NASA-CR-2243, RR-72-25
Contract NAS3-15341

Descriptors: *Brayton cycle, *Friction reduction, *Gas turbine engines, *Journal bearings, Equipment specifications, Performance tests, Product development.

For abstract, see STAR 1119

N73-28881/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FORTRAN 4 COMPUTER PROGRAM FOR CALCULATING CRITICAL SPEEDS OF ROTATING SHAFTS.
R. J. Trivisonno. Aug 73, 55p NASA-TN-D-7385, E-7017

Descriptors: *Computer programs, *Critical velocity, *Rotating shafts, Cantilever beams, Differential equations, Fortran, Plotters, Resonant frequencies.

For abstract, see STAR 1119

PAT-APPL-372143/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
OPTICAL ROTATIONAL SENSOR.
Patent Application.
J. R. Jamieson, Jr., and J. D. Stigberg. Filed 21 Jun 73, 12p NASA-CASE-KSC-10752-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antifriction bearings, *Optical equipment, *Rotating shafts, *Vibration effects, Frequency converters, Frequency measurement, Patent applications, Quality control, Surface defects.

A system for detecting defective components of machines is discussed. Emphasis is placed on detecting defects in bearing assemblies used for supporting a rotating shaft in a machine. The system includes an optical sensor which detects the rotation of the shaft of the motor for generating a frequency that can be multiplied or divided to provide synchronization frequencies. An accelerometer is coupled to the motor for sensing vibrations produced by the defective component and feeding the frequencies generated by such to a time averaging signal analyzer for observation. From analyzing the frequencies generated by the various components, defects can be determined.

PATENT-3 698 651/GA Not available NTIS
Office of the Secretary of the Army Washington D C
TAPE WRAPPING ARRANGEMENT.
Patent,
Donald Miller. Filed 1 Mar 71, patented 17 Oct 72, 5p Rept nos. PAT-APPL-119 777,
Previously filed as PAT-APPL-744 513, 12 Jul 68.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Tape wound construction, *Patents), (*Rocket motor nozzles, Thermal insulation), Rocket cases, Mandrels, Tapes, Drives.
Identifiers: PAT-CL-242-7-23.

The invention relates to tape wrapping apparatus, and more particularly, to shingle wrapping of tape about a rotating mandrel for use as insulative materials in rocket motor cases and nozzles.

PATENT-3 700 010/GA Not available NTIS
Office of the Secretary of the Army Washington D C
WIRE TYING APPARATUS INCLUDING DEMOUNTABLE TYING MECHANISM.
Patent,
Benjamin M. Bartilson, and Gerald A. Francis. Filed 17 Jun 71, patented 24 Oct 72, 7p Rept nos. PAT-APPL-154 111,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Wire-winding machines, *Patents), (*Field wire, *Cable assemblies), Small tools, Cables(Mechanical), Electric cables, Drives, Winding.
Identifiers: PAT-CL-140-93-A.

The patent relates to an improved apparatus for tightly joining a cluster of wires or cables which used counter-rotating heads to wrap a relatively stiff tie wire around the cluster. A ramp on one of the heads cams the tie wire into a position where it is picked up by a pulley on the other head. As the heads rotate in opposite directions the tie wire is restrained by the above-mentioned pulley as well as a pulley on the head that has the ramp, thereby causing a tight wrap. The heads are housed in a removable cartridge to facilitate maintenance.

PATENT-3 722 553/GA Not available NTIS
Office of the Secretary of the Army Washington D C
WIRE TYING APPARATUS INCLUDING TIMING AND STOPPING MECHANISM.
Patent,
Benjamin M. Bartilson. Filed 17 Jun 71, patented 27 Mar 73, 8p Rept nos. PAT-APPL-154 110,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Wire-winding machines, *Patents), Wire, Mechanical fasteners, Electric cables.
Identifiers: PAT-CL-140-93-A.

The patent describes an improved apparatus for tying a relatively stiff tie wire around a cluster of wires or cables. Counterrotating discs having wide slots enable the discs to be placed down around the cluster of wires to be tied. The apparatus has a timing mechanism for providing a predetermined number of revolutions of the wrapping discs and a stopping mechanism for stopping the discs at a specified point to insure that the slots will be aligned when the tie is completed thereby facilitating removal of the apparatus.

PATENT-3 724 919/GA Not available NTIS
Department of the Navy Washington D C
LOW FRICTION SEAWATER LUBRICATED BEARING JOURNAL ARRANGEMENT.
Patent,
Paul Lagally, and Robert P. Nagy. Filed 28 Dec 71, patented 3 Apr 73, 8p Rept nos. PAT-APPL-213 212,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Journal bearings, *Patents), (*Lubricant additives, Journal bearings), Sea water, Titanium alloys, Polyethylene plastics, Iodine compounds, Wear resistance.
Identifiers: PAT-CL-308-238.

The patent describes a new type of low friction bearing-journal arrangement which can be lubricated by seawater, wherein, the rubbing surface of a titanium journal in combination with a high density of polyethylene bearing is protected against scuffing or galling by a small concentration of iodine which may be absorbed at the bearing surface or be present as a water-soluble iodine salt or complex.

PB-223 641/2GA PC$3.25/MF$1.45
Sydney Univ. (Australia). Civil Engineering Labs.
DIRECT DESIGN OF TAUT CABLES UNDER UNIFORM LOADING.
Research rept.,
A. J. Wilson, and R. J. Wheen. Apr 73, 27p R-210

Descriptors: (*Cables(Ropes), Structural analysis), Design, Stresses, Deflection, Temperature, Loads(Forces), Australia.

The behaviour of tightly strung cables under uniformly distributed loading is considered. An expression is derived relating the cable deflection to the change in loading based on a parabolic approximation to the cable shape. Stresses in the cable are shown to be readily calculated. Equations for the unextended length of the cable lead to the consideration of the effect of temperature changes on deflected shape. The form of the analysis is shown to be suitable for the direct design of taut cables and this is demonstrated with an example.

UCRL-74672/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
REDUCTION OF MACHINE TOOL SPINDLE GROWTH.
J. B. Bryan, R. R. Donaldson, R. W. Clouser, and W. H. Blewett. 29 Mar 73, 23p CONF-730520-1

Descriptors: (*Machine tools, *Cooling), Oils.

For abstract, see NSA 28 03, number 07813.

13J. Marine Engineering

AD-767 033/4GA PC$3.75/MF$1.45
Catholic Univ of America Washington D C Dept of Civil and Mechanical Engineering
THE ESTABLISHMENT OF NOISE CRITERIA FOR RECREATIONAL BOATS.
Final rept. 1 Jun 72-31 Jan 73,
Edward B. Magrab. 20 Jul 73, 87p* USCG-D-14-73
Contract DOT-CG-24401-A

Descriptors: (*Boats, *Internal combustion engine noise), Marine engines, Sound transmission, Sound, Sound pitch, Hazards, Test methods.
Identifiers: Recreational boating, Motor boats, Outboard engines, Noise levels, *Noise pollution.

The noise emitted by recreational boats presents the following problems: noise pollution to by-standers, communication difficulties on-board, and permanent damage to an individuals hearing. A noise criteria must be determined first in order to solve these problems. A noise analysis of various common recreational boats and engines was conducted from measurements taken in the field. Standard test procedures for taking sound measurements exterior to and on-board recreational boats were established. The mean value of noise from large, small, and all motors were found to be 85.4, 80.2, and 82.9 dBA respectively. A noise level of 65 dBA is considered moderately noisy by most people. Therefore, most all motors emit an unacceptable level of noise to people in boating areas such as lakes, rivers, etc. The problem of communication among individuals on-board recreational boats may present a safety hazard and fog situation where warnings of danger must be spoken or ships' whistles and fog signals must be heard. A high noise level such as 82.9 of dBA over a long period of exposure may also be damaging to an individuals hearing. Standard test procedures have been established to measure the noise level emitted from recreational boats as a first step to help eliminate the above problems. (Author) Portions of this document are not fully legible.

AD-767 038/3GA MF$1.45
Purdue Univ Lafayette Ind Purdue Lab for Applied Industrial Control
SOME REPORTS ON THE STATE-OF-THE-ART IN AUTOMATION OF MODERN MERCHANT SHIPPING. VOLUME I. T/T SEA SERPENT.
Quarterly rept. no. 1, 16 May-15 Aug 73,
Donald H. Kern, and Theodore J. Williams. 15 May 73, 269p Rept no. 55-Vol-1
Contract N00024-73-C-5483, ARPA Order-2425
See also report dated 15 Aug 73, AD-767 039.
Availability: Available in microfiche only.

Descriptors: (*Merchant vessels, Automation), Tankers, Automata, Steering, Navigation, Marine engines, Control systems, Maintenance, Personnel.
Identifiers: *Anticollision systems, Collision avoidance, Computerized automation.

The report describes the results obtained from reviews of the state-of-the-art of ship automation. The automated systems of a merchant vessel is reported. (Author)

AD-767 039/1GA MF$1.45
Purdue Univ Lafayette Ind Purdue Lab for Applied Industrial Control
SOME REPORTS ON THE STATE-OF-THE-ART IN AUTOMATION OF MODERN MERCHANT SHIPPING. VOLUME II. CONFERENCES AND VISITS.
Quarterly rept. no. 1, 16 May-15 Aug 73,
Donald H. Kern, and Theodore J. Williams. 15 Aug 73, 220p Rept no. 55-Vol-2
Contract N00024-73-C-5483, ARPA Order-2425
See also report dated 15 Aug 73, AD-767 038.
Availability: Available in Microfiche only.

Descriptors: (*Merchant vessels, Automation), Tankers, Automata, Steering, Navigation, Marine engines, Control systems, Maintenance, Personnel.
Identifiers: *Anticollision systems, Collision avoidance, Computerized automation.

The report describes data acquired on ship automation by visits made to groups and organizations involved in relative activities. (Author)

AD-767 118/3GA Not available NTIS
British Ship Research Association Wallsend (England) Wallsend Research Station
JOURNAL OF ABSTRACTS OF THE BRITISH SHIP RESEARCH ASSOCIATION. VOLUME 28, NUMBER 8, ABSTRACTS NO. 34,940-35,144.
Aug 73, 85p
See also Volume 28, Number 7, AD-764 388.
Availability: Pub. in Jnl. of Abstracts, v28 n8 p574-657 Aug 73.

Descriptors: (*Ships, *Abstracts), Design, Construction, Shipyards, Ship structural components, Mechanical properties, Marine safety equipment, Marine engineering, Marine engines, Corrosion, Great Britain.
Identifiers: Offshore drilling, Offshore structures.

Contents:
Ship design;
Ship construction;
Ship machinery and systems;
Ship operation;
Ocean engineering.

AD-767 309/8GA PC$3.75/MF$1.45
Naval Research Lab Washington D C
A FORTRAN IV PROGRAM FOR COMPUTING THE STATIC DEFLECTIONS OF STRUCTURAL CABLE.
Final rept.,
Richard A. Skop, and James Mark. 31 Aug 73, 96p* Rept no. NRL-7640

Descriptors: (*Cables(Mechanical), Deflection), (*Underwater objects, *Mooring), (*Computer programs, Instruction manuals), Ocean currents, Anchors(Marine), Underwater equipment, Configuration.
Identifiers: FORTRAN, FORTRAN 4 computer language, DESADE computer program.

DESADE is a Fortran 4 program for computing the current-induced static deflections of Structural Cable Arrays. As dimensioned, the program can handle arbitrarily configured arrays of up to 22 cables. The cables can be electromechanical wire rope, or synthetic. Any number of discrete devices (buoyancy elements, current meters, tensiometers, etc.) can be incorporated in the array. An option for parametric studies is included in the program, as is an option for incorporating arbitrary current fields. As written, DESADE should compile on most Fortran 4 compilers with Boolean algebra capabilities. (Author) Portions of this report are not fully legible.

AD-767 323/9GA PC$3.00/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
DEEP-OCEAN PILE EMPLACEMENT SYSTEMS: CONCEPT EVALUATION AND PRELIMINARY DESIGN.
Final rept.,
D. A. Raecke. Aug 73, 41p* Rept no. NCEL-TN-1286

Descriptors: (*Foundations(Structures), Design), (*Underwater equipment, Ocean bottom), Hydraulic jacks, Templates, Deep water, Vibrators(Mechanical), Vibrators(Electrical), Anchors(Structural), Marine engineering.
Identifiers: *Pile structures, *Pile foundations, *Pile driving, Design criteria.

A previous review of the state-of-the-art of seafloor pile emplacement indicated that three types of mechanical systems could be developed for deep-ocean seafloor pile emplacement. The systems are: vibratory drivers, screw piles, and jack-in piles. Conceptual design for multiple-pile emplacement systems using each of these mechanical systems were developed and compared. The comparison showed that screw-piles would be the most effective in meeting the given operating requirements. A preliminary design for a pilot-model screw-pile emplacement system is presented. (Author)

AD-767 328/8GA PC$3.50/MF$1.45
Battelle Columbus Labs Ohio
EVALUATION OF NEW ALUMINUM GAS CYLINDERS FOR USE WITH THE SWIMMER DELIVERY VEHICLE.
Final rept. Jun 72-Jul 73,
N. C. Henderson, R. J. Eiber, S. C. Ford, W. I. Griffith, and D. W. Strauch. Jul 73, 68p* SupDiv-I-73
Contract N00014-70-C-0072

Descriptors: (*Pressure vessels, Performance(Engineering)), (*Underwater vehicles, Pressure vessels), Diving, Pressure, Buoyancy, Tensile properties, Rupture, Fatigue(Mechanics), Creep, Aluminum.
Identifiers: Swimmer delivery vehicles, Evaluation, Fatigue tests.

A program was conducted to determine the basic performance characteristics for a limited number of new aluminum gas cylinders for use with the Swimmer Delivery Vehicle. This research consisted of five major tasks: virgin burst experiments, cyclic fatigue experiments, computer analysis of existing alternate design configurations, extended time low temperature creep experiments, and buoyancy experiments. It was concluded that the (specified) operating pressure was significantly higher relative to the observed cylinder burst pressures when compared to the operating pressure to burst pressure ratios normally encountered in diving gas cylinders. It was recommended, therefore, that the operating pressure be reduced to 1500 psig. It was further recommended that the cylinders be inspected for cracks every six months or 100 cycles due to the localized high stresses discovered in the end cap. (Author)

AD-767 329/6GA PC$3.50/MF$1.45
Notre Dame Univ Ind Coll of Engineering
DYNAMIC ANALYSIS OF CRACKED NAVAL VESSELS,
Technical rept.,
R. F. Hegarty, and T. Ariman. Sep 73, 72p Rept no. UND-73-10
Contract N00014-68-A-0152

Descriptors: (*Naval vessels(Combatant), Cracks), (*Naval vessels(Support), Cracks), (*Structural shells, Mechanical properties), Ship hulls, Submarine hulls, Crack propagation, Fracture(Mechanics), Loading(Mechanics), Stresses, Numerical analysis, Cylindrical bodies, Aluminum, Steel.
Identifiers: Dynamic response, Cylindrical shells, Dynamic structural analysis.

The report deals with the dynamic response of a thin finite, elastic circular cylindrical shell representing a naval vessel to time-dependent loadings symmetric with respect to the axis of the cylinder. The shell contains an axial through crack of length 2c. The dynamic counterpart of Donnell's shallow shell equations are used in this investigation. Extensive numerical results are presented for stress intensity factors in aluminum and steel vessels and results are discussed. (Author)

AD-767 388/2GA PC$3.50/MF$1.45
Teledyne Materials Research Waltham Mass
A METHOD FOR DIGITIZING, PREPARING AND USING LIBRARY TAPES OF SHIP STRESS AND ENVIRONMENT DATA. PART I.
Final technical rept.,
Aldie E. Johnson, Jr., James A. Flaherty, and Isaac J. Walters. Feb 73, 63p Rept no. E-1149(c) SSC-236
Contract N00024-69-C-5161
Report on Ship Response Data Study.

Descriptors: (*Cargo ships, *Stresses), (*Data processing systems, Stresses), Magnetic tape, Real time, Statistical analysis, Ocean waves, Meteorological parameters, Tables.
Identifiers: Signal processing, Sea states.

Midship bending stress and environmental data from four dry-cargo ships, accumulated during the period 1959 through early 1970 under Ship Structure Committee Project SR-153, Ship Response Statistics, have been processed and written on digital magnetic tapes. During the processing, selected statistical information was derived which has been included on the digital tapes for each of the 13220 intervals recorded. The original FM analog data were contained on 163 reels of magnetic tape. The entire collection is now stored on 25 reels of digital tape and tape and pertinent reduced data from each interval are stored on two summary reels. Processor programs were written to convert the original analog data and environmental information to the final digital format and to provide a capability to extract portions of the data for subsequent statistical analysis. (Author)

AD-767 389/0GA PC$4.25/MF$1.45
Webb Inst of Naval Architecture Glen Cove N Y
LOAD CRITERIA FOR SHIP STRUCTURAL DESIGN.
Final technical rept.,
Edward V. Lewis, Dan Hoffman, Walter M. Maclean, Richard van Hooff, and Robert B. Zubaly. May 73, 118p* SSC-240
Contract N00024-71-C-5372

Descriptors: (*Ship hulls, Loading(Mechanics)), (*Cargo ships, Ship hulls), Ocean waves, Thermal stresses, Bending, Failure(Mechanics), Costs, Design.
Identifiers: Dynamic loads, Brittle fracture, Design criteria, *Structural design.

Consideration is given to the critical loads on ships' hulls, as indicated by possible modes of structural damage and/or failure. An ultimate load criterion is then set up involving the following bending moments: quasi-static wave-induced, vertical and lateral combined, still water, including effect of ship's own wave, dynamic loads, including slamming, whipping, and springing, and thermal effects. The determination of each of these loads is discussed in detail, and the need for further clarification of dynamic loads is brought out. Methods of combining these loads, all expressed in probability terms, are considered. A criterion for cyclic loading is discussed, involving the prediction of the expected number of combined loads of different levels, as well as the expected shifts of mean value. A criterion for brittle fracture is also discussed. Attention is given to estimating an acceptable probability of failure for use in design. Finally, calculations of loads are carried out for a typical cargo ship, the S.S. Wolverine State. The loads are then combined in accordance with the proposed ultimate load criterion and compared with the standards under which the ship was designed. (Author)

AD-767 428/6GA PC$3.50/MF$1.45
Paulling (J Randolph) Jr Orinda Calif
FLSTAB: RECREATIONAL SMALL BOAT FLOODED STABILITY PROGRAM.
Computer program and manual,
J. Randolph Pauling, Jr. Oct 72, 55p USCG-735101
Contract DOT-CG-23415-B

Descriptors: (*Boats, Buoyancy), (*Hydrostatics, *Computer programs), Floatation, Hulls(Marine), Bulkheads, Stability.
Identifiers: FLSTAB computer program, FORTRAN 4 programming language, FORTRAN.

A computer program is described which may be used to determine the equilibrium attitude of flotation and stability of a craft afloat in calm water with its interior volume flooded in free communication with the outside. The intact, buoyant portion of the craft comprises the thickness of its hull material plus other specific intact volumes. These are described either by giving a description of a series of transverse sections through each intact volume, or by describing horizontal, transverse, and longitudinal planes which form their boundaries. Several intact volumes of each type may be present and each may be partly permeable. The initial condition is described by giving the weight and center of gravity location of each of a group of items which make up the total weight of the craft and its contents. Output of the program consists of the intact drafts and heel angle, the flooded equilibrium position, and a table of righting arms versus heel angles in the flooded condition. (Author)

AD-767 440/1GA Reprint
California Univ Berkeley Dept of Naval Architecture
THE WAVE RESISTANCE OF SHIPS,
John V. Wehausen. 1973, 153p
Sponsored in part by the Office of Naval Research, Arlington, Va.
Availability: Pub. in Advances in Applied Mechanics, v13 p93-245 1973.

Descriptors: (*Ships, *Hydrodynamics), Water waves, Ship models, Mathematical analysis, Momentum, Theory.
Identifiers: Inviscid flow.

Contents: The measurement of wave resistance (Residuary resistance and refinements-Froude's method, Momentum considerations, Wave-pattern analysis); The analytical theory of wave resistance (The exact problem in an inviscid fluid, Perturbation expansions, Methods of solution, Further results, Numerical methods, Comparison of theory and experiment, Applications of the theory, Higher-order theories).

AD-767 457/5GA PC$15.50/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
ICEBREAKERS,
V. I. Kashtelyan, A. Ya. Ryvlin, O. V. Faddeev, and V. Ya. Yagodkin. Aug 73, 269p Rept no. CRREL-TL-418
Draft trans. of mono. Ledokoly, Leningrad, 22 Aug 72 287p.

Descriptors: (*Icebreakers, Design), Ship hulls, Ship plates, Marine surface propulsion, Control systems, Communication systems, Ice, USSR.
Identifiers: Translations.

The report describes the development and design of icebreakers, discusses methods of calculating their ice performance, design and arrangement features and points out paths toward further improvement. All present Soviet and foreign icebreakers are described, their operating conditions are analyzed, the basic ice performance characteristic of an icebreaker are examined (ice speed to power ratio, ice strength, maneuverability, jamming conditions), and methods of evaluating these qualities, developed by Soviet specialists, are set forth; the design features of the basic machinery and systems of icebreakers are noted; recommendations on their design are presented. A considerable part of the book is devoted to features of the choice of hull shape, main dimensions and power plant. Data on icebreakers hull design and relations for determining the strength dimensions of the framing and plating are presented. (Modified author abstract)

AD-767 636/4GA PC$2.75/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
1973 INSPECTION OF EXPERIMENTAL MARINE PILING.
Technical note,
Harry Hochman. Jul 73, 22p* Rept no. NCEL-TN-1298
See also report dated Dec 72, AD-753 194.

Descriptors: (*Foundations(Structures), *Protective treatments), (*Marine borers, Damage assessment), Wood, Underwater, Preservation, Creosote, Coal tar, Pelecypoda, Panama, Hawaii, Marine engineering, Pesticides.
Identifiers: *Pile structures, *Pile foundations, *Material degradation, *Marine borer prevention, *Biodeterioration, Materia, Limnoria.

The cooperative and NCEL experimental piles in Pearl Harbor, Hawaii and the cooperative piles in Coco Solo, Canal Zone were inspected in January and March 1973, respectively. Of the 120 piles that were inadvertently removed from test in August 1972 at Pearl Harbor, about half were redriven in May 1973. They showed that Martesia attack was greatest at the intertidal zone and that Limnoria attack was frequently greatest at the mud line. Cupro-nickel sheathing was severely corroded with large perforations at about the mid-exposure zone. (Author)

AD-767 639/8GA PC$3.00/MF$1.45
Naval Ship Research and Development Center Bethesda Md
THE EFFECT OF SURFACE PREPARATION AND REPAINTING PROCEDURES ON THE FRICTIONAL RESISTANCE OF OLD SHIP BOTTOM PLATES AS PREDICTED FROM NSRDC FRICTION PLANE MODEL 4125,
Eugene E. West. May 73, 30p Rept no. NSRDC-4084

Descriptors: (*Ship plates, Surface roughness), (*Ship hulls, *Antifouling coatings), Paints, Friction, Surface properties, Measurement.
Identifiers: Profilometers.

The Naval Ship Research and Development Center used a friction plane (NSRDC Model 4125) to estimate the differences in frictional resistance of two types of antifouling paints and of old ship bottom plates in three surface conditions. Photographs and roughness measurements are included for each surface investigated together with experimental data expressed as values of roughness allowance coefficient versus Reynolds number. (Author)

COM-73-11468/8GA PC$4.25/MF$1.45
Stevens Inst. of Tech., Hoboken, N.J. Davidson Lab.

SEAKEEPING TESTS OF A 250000 DWT TANKER MODEL IN VARIOUS BALLAST CONDITIONS.
Letter rept. (Final), 14 Jun-15 Jul 73,
J. F. Dalzell, and W. E. Klosinski. Jul 73, 45p SIT-DL-73-1687 MA-RD-900-74009
Contract MA-3-36299

Descriptors: (*Tanker ships, *Ship maneuvering), (*Ballast, Displacement), Ship models, Sea states, Maneuverability, Yaw, Oscillations, Steering, Loads(Forces).
Identifiers: Seakeeping.

The objective of the work was to produce model data to aid in the evaluation of the effect of different ballast displacements on seakeeping behavior of a typical 250,000 DWT tanker. A series of tests were made at three headings in long-crested irregular waves of two levels of severity. Additional parametric variations included four model displacement conditions and two speeds. Heave motions were of lower magnitude than would in general be expected. The most violent longitudinal motions occurred in bow seas. In general, the influence of ballast condition on motion magnitudes is not large. The incidence of propeller emergence appears worst in bow seas. Similarly, the effect of forward draft on keel emergence and the incidence of re-entry velocities greater than 17 ft/sec is very strong. It is apparent from the head sea relative motion results that the model was on the verge of supercritical operation in the model seas. This is important from the point of view of data interpretation and eventual design conclusions. (Author)

COM-73-11469/6GA PC$4.25/MF$1.45
Stevens Inst. of Tech., Hoboken, N.J. Davidson Lab.
MANEUVERING CHARACTERISTICS OF TANKERS. EFFECT OF DIFFERENT BALLAST DISPLACEMENTS ON SHIP PERFORMANCE.
Final rept. 14 Jun-15 Jul 73,
H. Eda, and W. Klosinski. Jul 73, 41p SIT-DL-73-1684 MA-RD-900-74008
Contract MA-3-36299

Descriptors: (*Tanker ships, *Ship maneuvering), (*Ballast, Displacement), Ship models, Surface navigation, Maneuverability, Yaw, Oscillations, Steering, Loads(Forces).
Identifiers: Seakeeping.

A study was made to evaluate the effect of ballast displacements on tanker maneuvering performance. A series of rotating-arm tests were made using a 5.17-ft. long model of a 250,000 DWT tanker to determine the necessary hydrodynamic coefficients for maneuvering motion predictions. Predictions of trajectories in entering turns, in Z-maneuvers, and in spiral maneuvers, indicate that the lightest loading condition (30% Load) among the three conditions examined in this study possesses the best overall maneuvering performance in calm water. An analysis based on the strip theory was made to estimate oscillatory yaw and sway motions in regular waves. Results indicate that the oscillatory yaw and sway motions are the largest for the lightest loading condition in quartering seas although the differences among the three conditions are not significant. It is expected that the lightest loading condition encounters the greatest difficulty in maneuvering under the presence of wind and wave disturbances. (Author)

COM-73-11540/4GA Reprint
Wisconsin Univ., Milwaukee. Center for Great Lakes Studies.
THE ECONOMIC MERITS OF EXTENDING THE ST. LAWRENCE SEAWAY NAVIGATION SEASON,
Eric Schenker, and David Smith. 1972, 15p WIS-SG-73-335 NOAA-73071801
Pub. in Proceedings of Conference on Great Lakes Research (15th) Apr 72, p737-750.

Descriptors: (*Surface navigation, *Saint Lawrence seaway), (*Water transportation, Winter), Seasons, Extensions, Ice breakup, Economic factors, Benefit cost analysis, Feasibility.
Identifiers: *Year round navigation, Sea Grant program, Uncertainity.

The paper explores the technical problems of extending the St. Lawrence Seaway navigation season, the costs of solving the problems, the economic benefits of an extended season; and a comparison of costs and benefits. The economics of a year-round season involve new technical solutions which are unknown at the present, and the costs are therefore difficult to estimate. Benefits, too, are difficult to estimate. The results of the study suggest that extension periods of four or six weeks are technically feasible and economically justified. Much must be done before it becomes meaningful to talk about a year-round season. (Modified author abstract)

N73-28183/4GA PC$3.50/MF$1.45
Hamburgische Schiffbau-Versuchsanstalt G.m.b.H. (West Germany).
INVESTIGATION ON THE PROBLEM OF GLASS FIBER REINFORCED PLASTIC PROPELLERS FOR SUBMARINES UNTERSUCHUNGEN ZUM PROBLEM: GFK-PROPELLER FUER U-BOOTE.
J. Krohn. 1973, 28p BMVG-FBWT-73-8
Subm-Sponsored by Bundesmin. Fuer Verteidigung.
In German; English Summary.

Descriptors: *Glass fibers, *Propellers, *Reinforced plastics, *Submarines, Bronzes, Cavitation flow, Chords (Geometry), Elastic bending, Hydrodynamics, Propeller blades, Stress analysis.

For abstract, see STAR 1119

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AEEW-M-1150/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
SHORT-TERM COLLAPSE OF TUBES UNDER EXTERNAL PRESSURE.
G. F. W. Stevens. Nov 72, 14p
U.S. Sales Only.

Descriptors: (*Stainless steels, *Failures), Deformation, Heat transfer, Mathematical models, Pressure dependence, Structural models, Time dependence, Tubes.

For abstract, see NSA 28 03, number 07653.

COM-73-50790/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
HIGH AND ULTRA-HIGH VACUUM BY PUMPING WITH CRYO-COOLED SURFACES.
Final rept.,
L. O. Mullen. 1972, 7p
Pub. in Proceedings of American Inst. Chemical Engineers, Symposium on Cryogenic Pumping, Denver, Colo., 1971.
Pub. in Vacuum Technology at Low Temperatures, v125 n68 p24-30 1972.

Descriptors: (*Cryopumping, Reviews), Performance evaluation, Vacuum pumps, High vacuum, Ultrahigh vacuum.

This presentation reviews the principles of pumping with cryogenically-cooled surfaces to produce high and ultra-high vacuum. The theory of cryopumping and entrapment by cryopumping, as well as some advantages and limitations are discussed.

PATENT-3 677 011/GA Not available NTIS
Department of the Air Force Washington D C
THRUST CONTROL SYSTEM FOR HYBRID ROCKET MOTORS.
Patent,
Clayton W. Vickland. Filed 22 Jan 69, patented 18 Jul 72, 3p Rept nos. PAT-APPL-793 195,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Check valves, *Patents), (*Hybrid rockets, *Controllable-thrust rocket motors), Specific impulse, Hypergolic rocket propellants, Thrust, Control systems.
Identifiers: PAT-CL-60-251, Restartable rocket motors, Poppet valves, Solenoid valves.

The patent relates to a tactical missile whereby a high specific impulse rocket motor having the impulse delivered at two thrust levels with restart capability has oxidizer supplied to an aft injector and to a plurality of primary injectors located within the forward ends of a plurality of fuel grain ports. The flow of oxidizer is controlled by two solenoid valves which control the sustain flow and the boost flow of oxidizer. Poppet valves are provided in the primary injectors and the aft injector and are opened by the pressure of the oxidizer delivered through the sustain system.

PB-223 745/1GA PC$10.75/MF$1.45
McDonnell Douglas Astronautics Co.-West, Huntington Beach, Calif.
DEFINITION OF REVERSE OSMOSIS PUMP REQUIREMENTS FOR SPACE VEHICLE REQUIREMENTS.
Final rept.,
M. S. Bonura, and G. W. Wells. Jun 73, 172p
MDC-G4744 Int-OSW-RDPR-73-892

Descriptors: (*Water treatment, Osmosis), (*Osmosis, Pumps), (*Aerospace life support systems, Water treatment), (*Pumps, Aerospace life support systems), Reciprocating pumps, Gear pumps, Centrifugal pumps, Vane pumps, Cost estimates, Performance evaluation, Design criteria.
Identifiers: Reverse osmosis.

The report covers the investigation of high-pressure reverse osmosis (RO) pumps for space vehicle application. The vendor pump survey and pump evaluation tasks are described in this report. Four selected RO pumps were ordered and evaluated during a 30-day test under spacecraft wash water recovery system conditions. A description of the test stand and the data from the pump evaluation test are contained in this report. The test data include pump power requirements, efficiency and other design parameters. The test data were used to develop recommendations for a flight-type prototype RO pump and a design specification for a high-pressure RO pump for space vehicle application. Also included are rough order of magnitude (ROM) costs for the development of a flight type RO pump. (Modified author abstract)

WAPD-TM-1086/GA PC$3.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Bettis Atomic Power Div.
INELASTIC COLUMN BUCKLING OF INTERNALLY PRESSURIZED TUBES. LWBR DEVELOPMENT PROGRAM.
J. B. Newman. Apr 73, 16p
Contract AT-11-1-Gen-14

Descriptors: (*Tubes, *Deformation), Aluminium, Materials testing, Mechanical structures, Pressure dependence, Strains, Stress analysis, Stresses, Tensile properties.

For abstract, see NSA 28 03, number 05483.

13L. Safety Engineering

AD-767 576/2GA PC$3.00/MF$1.45
Forest Products Lab Madison Wis
HOW FOURTEEN COATING SYSTEMS AFFECTED SMOKE YIELD FROM DOUGLAS-FIR PLYWOOD.
Forest Service research paper,
John J. Brenden. 1973, 29p Rept no. FSRP-FPL-214

Descriptors: (*Fire resistant coatings, *Plywood), (*Smokes, Fire resistant coatings), Light transmission, Optical analysis.
Identifiers: Computer aided analysis.

To measure the effect of coating materials on smoke yield of wood, Douglas-fir plywood of exterior grade A-C quality finished with 14 coating systems was subjected to fire exposure in a chamber similar to that used in a method proposed by the National Bureau of standards. Noncoated specimens and specimens coated with each of the 14 systems were exposed to both flaming conditions at three irradiation energy levels: 2.0, 2.5, and 3.0 watts per square centimeter. The purpose was to determine the smoke yield from uncoated wood under fire exposure and if the amount of smoke given off by wood could be reduced by the coatings. Smoke development was measured as a 'specific optical density' parameter based on light transmission, length of light path, area of specimen, and volume of the chamber. Comparisons were based on a maximum specific optical density parameter and on other parameters developed from specific optical density-time curves.

ARH-SA-157/GA PC$3.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash.
PROPOSED FIRE PROTECTION METHOD FOR 234-5 Z BUILDING PLUTONIUM EXHAUST SYSTEMS.
H. A. Lee. Mar 73, 11p CONF-730322-1
Contract AT(45-0)-2130

Descriptors: (*Filters, *Fire resistance), Fabrication, Industrial plants, Plutonium, Ventilation.

For abstract, see NSA 28 02, number 02540.

BNL-17761/GA PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
FIRE TESTS OF HALON 1301 EXTINGUISHING SYSTEMS FOR USE IN INSTRUMENT TRAILERS. FINAL REPORT.
J. B. Deitz. 13 Mar 73, 36p

Descriptors: (*Fire extinguishers, *Testing), Brominated aliphatic hydrocarbons, Electronic equipment, Fluorinated aliphatic hydrocarbons, Kerosene, Measuring instruments, Methanol, Organic bromine compounds, Organic fluorine compounds, Wood.

For abstract, see NSA 28 03, number 07662.

COM-73-50768/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE SENSITIVITY OF CERTAIN INDICES ASSOCIATED WITH TWO-VEHICLE ACCIDENTS.
Final rept.,
Alexander R. Craw, and Richard Ku. 1973, 10p
Pub. in Accident Analysis and Prevention, v5 p137-146 1973.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Applications of mathematics.
Identifiers: Sensitivity analysis.

The study describes in mathematical terms a procedure employed by the National Highway Traffic Safety Administration of the Department of Transportation for the analysis of two-vehicle accidents. The procedure contains an assignment rule in which one of the involved driver-vehicle combinations is assigned to the class of active involvement and the other driver-vehicle combination is assigned to the class of passive involvement. One case of interest is the random assignment rule, and this is contrasted with the results of a fixed assignment rule. Results are derived that show the effect on specific indices of (1) errors in assignment and (2) a composite assignment rule (a mixture of fixed and random rules).

N73-28592/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THE APPLICATION OF SPACE PROGRAM FIRE RETARDANT TECHNOLOGY TO HOUSING.
S. R. Riccitiello, and K. W. Heising. Aug 73, 17p
NASA-TN-D-7370, A-4874

Descriptors: *Fire prevention, *Retardants, *Technology utilization, Fireproofing, Foams.

For abstract, see STAR 1119

PB-223 399/7GA PC$2.75/MF$1.45
North Central Forest Experiment Station, St. Paul, Minn.
FIRE WHIRLWIND FORMATION OVER FLAT TERRAIN.
Forest Service research paper,
Donald A. Haines, and Gerald H. Updike. Dec 71, 17p FSRP-NC-71

Descriptors: (*Firestorms, Wind), (*Fire protection, Research), Fires, Vortices, Meteorology, Terrain, Adiabatic conditions.

Case studies indicate that optimum conditions for development of flat-terrain, fire whirlwinds include: (1) A fire of sufficient acreage and intensity to create the heat source. Methods of burning are also important. (2) A superadiabatic lapse rate through the lower 300 to 400 feet with a lapse near the dry adiabatic for 2,000 to 5,000 feet above; or just a deeper, lower layer containing a favorable lapse rate. (3) Little or no wind. (4) Clear skies, although fire whirlwinds have occurred under overcast conditions and even at night, clear skies are optimum. Even though fules will often burn well, less than 10 percent of fire-season days fulfill these conditions in the Upper Midwest.

PB-223 722/0GA PC$8.75/MF$1.45
University of Southern California, Los Angeles. Inst. of Aerospace Safety and Management.
MULTIDISCIPLINARY ACCIDENT INVESTIGATIONS, PHASE 1.
Final rept. Jun 71-Jul 72,
Willis H. Wood, and Jack D. Baird. Jun 73, 442p
USC-MR-5 DOT-HS-800 876
Contract DOT-HS-010-1-176

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Human factors engineering, Automobiles, Highways, Design standards, Traffic safety, California.

The report summarizes the results of a comprehensive and systematic study of 40 motor vehicle accidents that occurred in the metropolitan area of Los Angeles, California. The research was performed by a multidisciplinary accident investigation team of the University of Southern California. The study includes the investigation program objectives and procedures and presents an analysis of the collisions with conclusions and recommendations. Summary reports of each collision case are offered.

PB-223 737/8GA PC$3.00/MF$1.45
Boston Univ., Mass. Accident Research Team.
HUMAN FACTOR VARIABLES AND FATAL VEHICULAR ACCIDENTS: A PILOT STUDY.
Final rept. 1 Oct 71-30 Sep 72,
Robert S. Sterling-Smith. Sep 73, 47p* DOT-HS-800 921
Contract FH-11-7402

Descriptors: (*Motor vehicle accidents, *Accident investigations), (*Human factors engineering, Motor vehicle accidents), Behavior, Psychology, Drug addiction, Criminal investigations, Blood chemical analysis, Ethyl alcohol, Massachusetts.

The report is one of the Multidisciplinary Traffic Accident Research special studies in human factor variables and fatal motor vehicle accidents in the greater Boston area. The results represent the initial findings related to 50 fatal motor vehicle accidents. A description of research design and methodology are given as well as results, case studies, and conclusions and recommendations. Portions of this document are not fully legible.

SC-M-70-889/GA PC$11.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
MANUAL FOR INDUSTRIAL SAFETY, FIRE PREVENTION, ENVIRONMENTAL HEALTH.
7 Jan 71, 192p

Descriptors: (*Safety engineering, *Manuals), (*Safety, Manuals), Electrical equipment, Explosives, Fire hazards, Hazards, Health hazards, Industrial accidents, Injuries, Personnel, Radiation protection, Recommendations, Welding.

For abstract, see NSA 28 03, number 05511.

UCRL-74324/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
HIGH SECURITY DIGITAL ALARM SYSTEM.
D. G. West. 19 Feb 73, 12p CONF-730421-1

Descriptors: Alarm systems, Communications, Inspection.

For abstract, see NSA 28 03, number 07808.

13M. Structural Engineering

AD-767 247/0GA PC$2.75/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
CIRCULAR FOOTINGS ON VISCOELASTIC FOUNDATIONS.
Technical rept.,
T. M. Lee. Sep 73, 21p Rept no. CRREL-TR-242

Descriptors: (*Foundations(Structures), Vibration), Interactions, Mechanical impedance, Viscoelasticity, Resonant frequency, Damping, Design.
Identifiers: Footings, Dynamic response.

The interaction of a vibrating circular footing with its foundation was investigated. To account for the energy dissipation when propagating through the supporting ground, the foundation was assumed to behave as a viscoelastic medium. The response of the footing was found to depend upon its own mass and vibration frequencies and the foundation material properties. But, for the convenience of engineering applications, the response was expressed in terms of a scaled amplitude ratio and the static deflection of the footing. Curves for the scaled amplitude ratio were presented and their possible applications to design problems were illustrated. (Author)

AD-767 454/2GA PC$3.00/MF$1.45
Federal Aviation Administration Washington D C Systems Research and Development Service

A POTENTIAL DESIGN WINDOW FOR SUPERSONIC OVERFLIGHT BASED ON THE PERCEIVED LEVEL (PLDB) AND GLASS DAMAGE PROBABILITY OF SONIC BOOMS.
Final rept.,
Thomas H. Higgins, and Larry K. Carpenter. Aug 73, 28p Rept no. FAA-RD-73-116

Descriptors: (*Glass, Damage), (*Supersonic flight, *Sonic boom), Jet plane noise, Pressure, Sonic fatigue, Acoustics, Tolerances(Physiology).
Identifiers: Window glass, Overpressure, Design criteria, Sound pressure, Perceived level.

A potential design window for supersonic overflight based on the perceived level (PLdB) and glass damage probability of sonic booms is outlined. The evaluation of a simple operational method of estimating the perceived level (PLdB) of sonic booms is discussed and compared with the Fourier transform computer program calculations of Pease based on the theory of Zepler and Harel. The resulting estimated perceived levels are in good agreement i.e., within 1 to 2 PLdB of each other in the important potential certification or design window that is in the 90 to 100 PLdB range. These perceived levels are shown to be acceptable to 95 to 100 percent of the people exposed to them. (Modified author abstract)

AD-767 566/3GA PC$3.50/MF$1.45
Forest Products Lab Madison Wis
PRINCIPLES FOR PROTECTING WOOD BUILDINGS FROM DECAY.
Forest Service research paper,
T. C. Scheffer, and A. F. Verrall. 1973, 59p* Rept no. FSRP-FPL-190

Descriptors: (*Buildings, Wood), (*Wood, Protection), (*Preservation, Buildings), (*Degradation, Wood), Construction materials, Fungus deterioration, Moisture, Foundations(Structures), Walls, Floors, Roofs, Impregnation.

Problems caused by decay in buildings in the United States and the means to avoid or control them are dealt with in this work. The principal moisture situations and construction features most responsible for the occurrence of decay in various building parts are described, and directions are given for approximately modifying or eliminating undesirable conditions. Emphasis throughout is on the two primary means of protecting against decay: (1) The use of dry wood and of construction methods to keep wood dry, and (2) methods to treat wood with a suitable preservative in areas where dry conditions cannot be maintained.

AD-767 613/3GA PC$4.75/MF$1.45
Condex Corp Camden N J
IMPROVED DIELECTRIC GUY CABLE.
Final rept.,
Alvin A. Cadwallader. Aug 73, 155p RADC-TR-73-202
Contract F30602-72-C-0059

Descriptors: (*Cables(Mechanical), Anchors(Structural)), Dielectric properties, Antenna masts, Loran, Steel, Glass textiles, Isocyanate plastics, Physical properties.
Identifiers: *Guy wires.

The report describes the evolution, theory, development, manufacture, and test of a new type of high strength, dielectric guy cable for use with Loran C and D type towers and other similar systems requiring reliable guying and catenaries. Designated as 'Condex Tri-Laminar Cable,' it consists of straight tensile member elements, multiple and parallel, which are helically positioned or caged in a circular, linear array confined in thermoplastic structures at a relatively long helical pitch. The composite, caged, tensile member structures are coaxially built-up in separate contrapitch layers to achieve the desired cable strengths. Each caging thermoplastic layer is designed to keep each tensile member isolated from its neighbor to prevent them from abrading each other when the cable is loaded, vibrated, or flexed. By using this design characteristic, it is possible to control the tensile member spacing with precision at any pre-determined angle of pitch. It is possible to design and fabricate cables that are unusually flexible and inherently torque free. (Author)

JAB-99-103/GA PC$4.00/MF$1.45
Blume (John a.) and Associates Research Div., San Francisco, Calif.
TIME DOMAIN ANALYSIS OF STRUCTURE MOTIONS.
J. D. Raggett. Apr 73, 45p
Contract AT(26-1)-99

Descriptors: (*Mechanical structures, *Mechanical vibrations), (*Ground motion, *Seismic waves), Mathematical models, Seismic effects, Wave propagation.

For abstract, see NSA 28 02, number 02532.

N73-28887/0GA PC$3.00/MF$1.45
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
ON THE EFFECT OF ORTHOTROPY IN A CRACKED CYLINDRICAL SHELL.
F. Erdogan, M. Ratwani, and U. Yueceoglu. Feb 73, 14p NASA-CR-132295, NASA-TR-73-2
Contract NGR-39-007-011

Descriptors: *Cracks, *Cylindrical shells, *Orthotropism, Graphite, Modulus of elasticity, Pressure effects, Stress ratio, Titanium.

For abstract, see STAR 1119

PB-223 254/4GA PC$10.50/MF$1.45
Washington Univ., St. Louis, Mo. Building Industrial Research and Development Group.
COMPONENT BUILDING AND THE ORGANIZATION OF THE BUILDING PROCESS: A STUDY OF JOINTS AND JOINTING. ABSTRACTS 1959-1971. COMPONENTS 1, 3 AND 4.
Final rept.,
Colin H. Davidson. 1971, 167p
Grant NSF-GK-4526
See also PB-223 255 and PB-223 256.

Descriptors: (*Prefabrication, *Construction management), (*Joints(Junctions), Construction management), (*Joining, Construction management), Buildings, Construction, Decision making, Design, Structural members.

The problem of joints and jointing in component building is primarily not technological but organizational. This applied research project investigates the organizational aspects of industrialized building, adopting an argumentative problem-solving methodology. There are 3 main components to the report: - Information System - collection of abstracts - summaries of interviews and case studies; Factual Information - discussion of key terms, recommendations on joint design, glossary, and Debate - an analysis and synthesis of the case studies.

PB-223 255/1GA PC$13.50/MF$1.45
Washington Univ., St. Louis, Mo. Building Industrial Research and Development Group.
COMPONENT BUILDING AND THE ORGANIZATION OF THE BUILDING PROCESS: A STUDY OF JOINTS AND JOINTING. ABSTRACTS 1959-1971. COMPONENT TWO: INFORMATION SYSTEM VOLUME I.
1971, 229p
Grant NSF-GK-4526
See also PB-223 256 and PB-223 254.

Descriptors: (*Prefabrication, *Construction management), (*Joints(Junctions), Construction management), (*Joining, Construction management), Buildings, Abstracts, Construction, Structural members, Fasteners, Subassemblies, Standards, Quality control, Joint fillers, Installing.

A collection of abstracts is presented covering an industrial survey of existing work and practices in the field of joints and jointing in component building. Included are recommendations for component design and implementation of joints and joint standardization. It is organized by the keyword system.

PB-223 256/9GA PC$12.50/MF$1.45
Washington Univ., St. Louis, Mo. Building Industrial Research and Development Group.
COMPONENT BUILDING AND THE ORGANIZATION OF THE BUILDING PROCESS: A STUDY OF JOINTS AND JOINING (ABSTRACTS 1959-1971). COMPONENT TWO: INFORMATION SYSTEM VOLUME 2.
1971, 208p
Grant NSF-GK-4526
See also PB-223 254 and PB-223 255.

Descriptors: (*Prefabrication, *Construction management), (*Joints(Junctions), Construction management), (*Joining, Construction management), Buildings, Abstracts, Construction, Structural members, Fasteners, Subassemblies, Standards, Quality control, Joint fillers, Installing.

A collection of abstracts is presented covering an industrial survey of existing work and practices in the field of joints and jointing in component building. Included are recommendations for component design and implementation of joints and joint standardization. It is organized by the keyword system.

PB-223 364/1GA PC$10.25/MF$1.45
California Univ., Berkeley. Coll. of Engineering.
NONLINEAR ANALYSIS OF REINFORCED CONCRETE SLABS AND SHELLS.
Final rept.,
Cheng-Shung Lin. Apr 73, 169p UCSESM-73-7
Grant NSF-GK-28073
Report on Structures and Materials Research.

Descriptors: (*Concrete structures, Loads(Forces)), (*Shells(Structural forms), *Reinforced concrete), (*Stress analysis, Reinforced concrete), Elastic analysis, Crack propagation, Nonlinear systems, Stiffening, Stress-strain diagrams.
Identifiers: Finite element analysis, Computer aided analysis.

A general finite element method of analysis is developed to analyze reinforced concrete slabs of arbitrary geometry and free-form shells under loads and monotonically increasing live loads. The method can be used to trace the load-deformation response and crack propagation through the elastic, inelastic and ultimate ranges. The internal concrete and steel stresses can also be determined for any state of the response history. The nonlinear analysis includes cracking of the concrete, the tension stiffening effect of concrete between cracks, and the nonlinear stress-strain relationships for the concrete and steel reinforcement. A general computer program is developed to implement the analysis. Validity of the method is studied by comparing the analytical results with experimental data. Effects of various important parameters are also discussed. (Modified author abstract)

PB-223 599/2GA PC$10.00/MF$1.45
National Academy of Engineering, Washington, D.C.
THE ENGINEERING ASPECTS OF THE QIR EARTHQUAKE OF APRIL 10, 1972 IN SOUTHERN IRAN.
Technical rept.,
Reza Razani, and Kenneth L. Lee. 1973, 160p
Contract NSF-C310

Descriptors: (*Earthquakes, *Iran), Tectonics, Earth movements, Earthquake resistant structures, Structural members, Damage assessment, Structural design, Engineering standards, Building codes, Safety engineering.
Identifiers: *Earthquake engineering, Qir(Iran).

The report describes an inspection of the Qir, Iran, earthquake of April 10, 1972, which was made for the Committee on Natural Disasters of the National Academy of Engineering. A total of seven days was spent in the earthquake zone itself, after which the team returned to Shiraz to draft the report. The report describes the earthquake-stricken area and the human and engineering aspects of the earthquake effects. The seriousness of earthquake risks and the problem of earthquake hazard minimization in Iran are discussed and the urgency of enforcing a seismic building code for urban construction is pointed out. Various recommendations for improving the seismic strength of structures and for carrying out necessary research, education organizational and legislative activities in Iran are given.

PB-223 642/0GA PC$3.50/MF$1.45
Sydney Univ. (Australia). Civil Engineering Labs.
AUTOMATIC PLASTIC ANALYSIS OF RESTRAINED SWAY-COLUMNS.
Research rept.,
F. Cheong Siat Moy. May 73, 27p R-213

Descriptors: (*Columns(Supports), Plastic analysis), Design, Bending moments, Stresses, Mathematical models, Deflection, Australia, Structural steel.
Identifiers: Computer aided analysis.

Solutions to problems of restrained columns with permitted sway form the basis for the plastic analysis of subassemblages of unbraced steel frames. These solutions have generally been obtained by the use of nomographs which are developed manually with the aid of the Column Deflection Curves. In this paper, a computer method which is suitable for several common structural steel cross sections and which eliminates the use of nomographs is described. The present approach depends upon the prediction of the bending moments in the restrained columns. Its accuracy is first established by investigating in detail some typical cases of restrained columns and comparing the results with those using the nomographs. With the present approach, it has been possible to study readily the influence of cross sectional shapes on the moment and shear capacity of end-restrained columns free to sway.

PB-223 643/8GA PC$3.75/MF$1.45
Sydney Univ. (Australia). Civil Engineering Labs.
AUTOMATIC PLASTIC ANALYSIS OF SWAY SUBASSEMBLAGES.
Research rept.,
F. Cheong Siat Moy. May 73, 34p R-214

Descriptors: (*Rigid frames, Plastic analysis), Design, Loads(Forces), Flexural strength, Deflection, Stresses, Mathematical models, Australia, Computer programming, Structural steel, Automation.

The subassemblage method of analysis of rigidly-jointed sway frames is essentially a hand method making use of manually-produced design charts for determining the shear-carrying capacities of one-story assemblages. The volume of routine work involved can make it a tedious method for the designing engineer. An automatic method which can efficiently generate the required design charts for several types of cross sections and which can combine them in a straightforward manner is described in this paper. The accuracy of the proposed method is comparable with that of the traditional manual method.

PB-223 644/6GA PC$3.25/MF$1.45
Sydney Univ. (Australia). Civil Engineering Labs.
SURFACE SETTLEMENT OF A DEEP ELASTIC STRATUM WHOSE MODULUS INCREASES LINEARLY WITH DEPTH.
Research rept.,
P. T. Brown, and R. E. Gibson. Feb 73, 21p R-207

Descriptors: (*Flexible foundations, *Settlement(Structural)), Modulus of elasticity, Mathematical analysis, Poisson ratio.
Identifiers: Youngs modulus.

An examination has been made of the behaviour of a half-space of elastic material of constant Poisson's ratio, whose Young's modulus increases linearly with depth, and which is subject to a strip or circle of uniform load. Poisson's ratio was considered in the range zero to one-half, and the surface modulus ranged from zero to the value corresponding to a homogeneous material. Numerical values are presented for vertical surface displacement due to a load uniformly distributed over a circular area for Poisson's ratio = 1/2, 1/3 and 0, and for a wide range of inhomogeneity. (Author)

PB-223 763/4GA PC$11.25/MF$1.45
California Univ., Berkeley. Earthquake Engineering Research Center.
ADAP - A COMPUTER PROGRAM FOR STATIC AND DYNAMIC ANALYSIS OF ARCH DAMS,
Ray W. Clough, Jerome M. Raphael, and Soheil Mojtahedi. Jun 73, 182p EERC-73-14
Sponsored in part by Bureau of Reclamation, Denver, Colo.

Descriptors: (*Arch dams, Dynamic response), (*Structural analysis, Computer programming), Static loads, Dynamic loads, Earthquakes, Seismic waves, Load(Forces), Mathematical models, Foundations, Stresses.
Identifiers: Finite element analysis, Earthquake engineering, ADAP computer program.

The development of a finite element computer program for linear static analysis and dynamic earthquake response analysis of arch dam-foundation systems is described. The program uses most of the logical features of the computer program SAP. Three different element types are included in the program; these are considered to be the most suitable elements for use in the three dimensional analysis of arch dam systems. The program generates the finite element mesh of the system from a relatively small amount of input data, performs a static or dynamic analysis of the system and prints out the resulting displacements and stresses. The dynamic part of the program uses special numerical procedures which are shown to be very efficient in the analysis of arch dams. The report includes a brief description of the elements, a study algorithm and the analysis capabilities of the program. Finally the application of the program to the static and earthquake response analysis of the Morrow Point dam is demonstrated. (Author)

SLA-73-357/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SOLAR COMMUNITY AND THE CASCADED ENERGY CONCEPT APPLIED TO A SINGLE HOUSE AND A SMALL SUBDIVISION. A STATUS REPORT.
R. B. Pope, and W. P. Jr. Schimmel. May 73, 35p

Descriptors: (*Solar energy, *Energy storage), Air conditioning, Buildings, Electric power, Energy conversion, Heat transfer, Heating, Solar heating, Water.

For abstract, see NSA 28 03, number 07615.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-767 037/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DEVICE FOR CREATING PULSATIONS OF PRESSURE DURING DYNAMIC TESTS OF SENSORS,
V. V. Ivanov, and V. I. Lagutin. 27 Aug 73, 8p
Rept no. FTD-HT-23-166-74
Edited trans. of Patent (USSR) 334 496 p1-2, 30 Mar 72, by Robert D. Hill.

Descriptors: (*Pulse generators, Pressure), Sensors, Test equipment, Patents, USSR.
Identifiers: Translations.

The patent refers to a monitoring and measuring technique, in particular, to devices for creating pulsations of pressure used for dynamic tests of differential pressure sensors or systems, for example, in experimental aerodynamics.

AD-767 042/5GA PC$3.00/MF$1.45
Radio Corp of America Burlington Mass Aerospace Systems Div
EQUATE - NEW CONCEPTS IN AUTOMATIC TESTING,
J. Kelley, and P. M. Toscano. 1973, 10p
Contract DAAB05-71-C-2461
Presented at the Automatic Support Systems Conference, Philadelphia, Pa., 13-15 Nov 72.

Descriptors: (*Circuit testers, Automation), Test equipment(Electronics), Programming(Computers), Compilers.
Identifiers: *Automatic test equipment, *Computer aided testing, EQUATE system, Computer program verification, Fault detection, Fault isolation, FORTRAN, FORTRAN 4 programming language, ALGOL, ALGOL 60 programming language, Operating systems(Computers).

The EQUATE is a computer controlled automatic test system for use in the performance of acceptance testing on a wide variety of circuits, assemblies and systems and the on-line generation, editing and validation of test programs. The system is designed for use by the engineer or technician inexperienced in computer programming. The computer is used to control the generation of UUT(Unit Under Test) waveforms and analyze UUT response signals. In this manner both standard and non standard waveforms may be generated by one general purpose device. All waveforms and normal parameters are measured and analyzed. Special design features of EQUATE will be presented, such as the optical dial and meter reader and the UUT control driver whose functions are to reduce operator participation in the acceptance tests. Conclusions will include a summary contracting EQUATE with classic ATE designs.

AD-767 076/3GA PC$4.75/MF$1.45
Minnesota Univ Minneapolis Dept of Electrical Engineering
OPTICALLY INDUCED DIFFRACTION GRATINGS IN LIQUID AND SOLIDS.
Technical rept.,
David R. Dean. Aug 73, 165p Rept no. TR-73-02
Contract N00014-68-A-0141-0002

Descriptors: (*Non-destructive testing, Optical analysis), Lasers, Diffraction, Refractive index, Scattering, Liquids, Solids, Diffraction gratings, Carriers(Semiconductors).

Identifiers: Two photon absorption, Ruby lasers, Argon lasers, Acoustic scattering, Holography, Light scattering, Acoustooptic interactions, Ultrasonic attenuation, Acoustic velocity, Carrier lifetime.

The report describes the measurement of physical constants of a medium by an 'all optical' technique. From the temporal behavior of the light diffracted by transient, 'optically induced' gratings, the velocity of sound and thermal diffusivity of several materials have been determined and semiconductors carrier lifetimes have been determined. The method can be extended to the measurement of acoustic attenuation. Bulk properties of small samples can be measured without surface effects by inducing small optical perturbations in the refractive index delta n/n approximately equal 10 to the minus 5th power. (Author)

AD-767 097/9GA Reprint
Florida Atlantic Univ Boca Raton Dept of Physics
GERMANIUM RESISTANCE THERMOMETERS: RESISTANCE VS. TEMPERATURE AND THERMAL TIME CONSTANT CHARACTERISTICS,
J. S. Blakemore. 1973, 9p AFOSR-TR-73-1618
Grant AF-AFOSR-2175-72
Availability: Pub. in Temperature Its Measurement and Control in Science and Industry, v4 pt2 p827-833 n.d.

Descriptors: (*Resistance thermometers, Germanium), Thermal properties, Resistance(Electrical), Semiconductors, Doping, Arsenic, Performance(Engineering), Cryogenics.
Identifiers: Semiconductor doping, *Cryogenic thermometers.

It has been found that polynomials of fairly high degree can fit the behavior of arsenic-doped Ge thermometers over rather wide temperature ranges. The time constant of such thermometers is typically some 0.03 seconds for an encapsulated sensor immersed in liquid helium, even though Ge bar in such a sensor has a thermal capacity of only 4 x 10 to the minus 7th power J/deg at 4.2K. In fact, the strain-free wiring system within the case contributes more than 90 percent of the thermal capacity for transient changes at 4.2K. It will further be shown that thermal conduction through helium transfer gas within the sensor is not the major controller of the response time; nearly 70 percent of the thermal conduction occurs along the electrical leads. (Modified author abstract)

AD-767 150/6GA Reprint
Chicago Univ Ill James Franck Inst
ROTATING SAMPLE MAGNETOMETER FOR DIAMAGNETIC SUSCEPTIBILITY MEASUREMENTS,
Stephen J. Hudgens. 15 Jan 73, 5p AFOSR-TR-73-1642
Contract F44620-71-C-0025
Revision of report dated 15 May 72.
Availability: Pub. in Review Scientific Instruments, v44 n5 p579-581.

Descriptors: (*Magnetometers, Design), (*Magnetic materials, Measurement), Magnetic moments, Statistical functions, Performance(Engineering).
Identifiers: Diamagnetism, Magnetic susceptibility.

A rotating sample magnetometer capable of measuring the relative room temperature magnetic susceptibilities of two 1 g samples with a reproducibility of delta chi/chi = 0.02 is described. The sensitivity of the instrument is delta chi = plus or minus 3 x 10 to the minus 9th power, or approximately 1% of the volume susceptibility of a typical diamagnetic solid. The magnetometer signal waveform is electronically processed by either a commercial signal correlator or by a gated double integrator of our own design. (Author)

AD-767 184/5GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
A MOTION STUDY OF THE FRANK J. SEILER RESEARCH LABORATORY GUIDANCE TEST FACILITY.
Instrumentation papers,
Francis A. Crowley, and Henry A. Ossing. 16 Jul 73, 24p Rept nos. AFCRL-IP-195, AFCRL-TR-73-0417

Descriptors: (*Test facilities, Inertial guidance), Stabilized platforms, Motion, Measurement.

Motion measurements taken at the inertial guidance test facility of the Frank J. Seiler Research Laboratory are applied to problems of facility design and inertial hardware testing. Motion measurements are processed to form unambiguous estimates of platform strain, rotation, and translation to allow a determination of the loop response of the test platform to ground motion and intralaboratory disturbances. In its open loop state, intralaboratory disturbances are found to be dominant source of platform motion, even under quiet conditions. (Author)

AD-767 244/7GA PC$3.50/MF$1.45
Picatinny Arsenal Dover N J
A NOVEL METHOD FOR SELECTING ULTRASONIC TRANSDUCERS TO INSPECT TUBULAR-SHAPED PARTS.
Final rept. May-30 Jun 73,
Henry Hartmann. Jun 73, 52p Rept no. PA-TR-4531

Descriptors: (*Non-destructive testing, Ultrasonic radiation), (*Transducers, Ultrasonic radiation), Pipes, Cylindrical bodies, Selection.
Identifiers: Ultrasonic tests.

The report contains guidance for the proper selection of ultrasonic transducers to be used for inspecting tubular-shaped parts. Specific recommendations cover transducer shape, size and focal length. There are general recommendations for transducer frequency.

AD-767 524/2GA PC$2.75/MF$1.45
Army Electronics Command Fort Monmouth N J
REMOVABLE INTERDIGITAL ELECTRODES FOR SURFACE WAVE STUDIES.
Technical rept.,
I. N. Greenberg, and F. P. Lipschultz. Sep 73, 12p Rept no. ECOM-4155

Descriptors: (*Signal generators, Mechanical waves), Electrodes, Metal films, Glass, Piezoelectric crystals, Demodulation, Rayleigh waves.
Identifiers: Surface waves, *Acoustic surface waves.

Interdigital electrode structures were fabricated on polished glass plaques. By placing the plaques next to the surface of a piezoelectric material and exciting the electrode of the transmitting plaque with pulsed RF energy of the appropriate frequency, good acoustic surface waves are received at a similar plaque at the opposite end of the sample. The plaque electrodes are fragile but reusable if handled with care. (Author)

AD-767 612/5GA PC$7.25/MF$1.45
Bendix Research Labs Southfield Mich
THE MECHANISM OF EXOELECTRON EMISSION FROM SOLID SURFACES.
Final rept.,
P. Braunlich, J. Carrico, B. Rosenblum, and L. Himmel. Sep 73, 112p Rept no. BRL-6775
AFOSR-TR-73-1673
Contract F44620-72-C-0064

Descriptors: (*Electron microscopy, Surface properties), Lithium compounds, Niobates, Coherent radiation, Radiation damage, Dielectrics, Metals, Non-Destructive testing.
Identifiers: *Exoelectron emission spectroscopy, Lithium niobates.

The results of a 15-month study of the mechanisms responsible for exoelectron emission are described in the final report. Included are: (1) a literature review, (2) descriptions of exoelectron imaging techniques, an ultrahigh vacuum system for exoelectron studies, and a retarding potential analyzer for energy distribution measurement of exoelectron emission, (3) a discussion of a new exoelectron phenomenom in pyroelectric materials, (4) outline of work planned for the future, and (5) publications. (Author)

AD-767 626/5GA PC$2.75/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
A DESIGN FOR A HYDROSTATIC PRESSURE CHAMBER FOR CALIBRATING PIEZOELECTRIC PRESSURE TRANSDUCERS.
Technical note,
H. C. Turner. May 70, 12p Rept no. ERDE-TN-20
DRIC-BR-21258

Descriptors: (*Piezoelectric transducers, Calibration), Test equipment, Pressure vessels, High-pressure valves, Great Britain, Underwater explosions.

The measurement of the intensity and duration of underwater shock waves uses piezoelectric transducers permanently sealed to one end of a coaxial cable. A hydrostatic pressure chamber with a fast pressure release for the calibration of these transducers is described. The chamber has been designed to operate at pressures up to 10.4 MN/sq m. Pressure is obtained from a built in manual hydraulic screw pump and the pressure is released by a specially designed quick acting valve.

AD-767 629/9GA PC$3.50/MF$1.45
Advanced Technology Labs Inc Westbury N Y
ANALYSIS OF WALL MODIFICATION IN A TRANSONIC WIND TUNNEL,
Paolo Baronti, Antonio Ferri, and Thomas Weeks. Feb 73, 53p Rept no. ATL-TR-181 AFOSR-TR-73-1900
Contract N00014-72-C-0201

Descriptors: (*Transonic wind tunnels, Walls), Interference, Corrections, Pressure, Angle of attack, Airfoils.

A method for transonic wind tunnel corrections based on the concept of measuring streamline deflection and pressure in the vincinity of the tunnel walls, and of analytically determining the streamline deflection that corresponds to the measured pressure and the pressure that corresponds to the measured streamline for external uniform free stream conditions at the same Mach number of the test was experimentally investigated. The method involves the additional step of determining the required wall porosity variation or proper wind tunnel cross sectional areas variation and then making the requisite wind tunnel adjustments to obtain interference free flow. Two, two-dimensional, 6% thick circular-arc airfoils were tested at several angles of attack and at free stream Mach numbers of 0.91 and 0.95 in the AFFDL Tri-Sonic Gasdynamics Facility at Wright-Patterson AFB. Only the portion of the data related to zero angle of attack is analyzed in this report. The analysis provides a verification of the experiments themselves, gives some indication of the characteristics of the tunnel ventilated walls, indicates the sensitivity required of the measurements and defines the wall modifications which are required for interference-free conditions. (Author)

AD-767 653/9GA PC$5.75/MF$1.45
Naval Postgraduate School Monterey Calif
FIBER OPTIC AND LASER DIGITAL PRESSURE TRANSDUCERS.
Master's thesis,
John Wallis Leonard. Jun 73, 74p

Descriptors: (*Pressure gages, Design), Transducers, Fiber optics, Lasers, Digital systems, Theses.

Identifiers: Pressure measurement.

The theory and response of fiber optic pressure transducers were investigated in a continuation of previous research. A 0.125-inch diameter transducer was built and statically tested. A probe consisting of two concentric glass fiber bundles was used to transmit light to and from the transducer diaphragm. Response was linear through 60 inches Hg. Linearity and sensitivity of response were dependent on diaphragm thickness and probe location, respectively. In a separate experiment, a gas laser was externally modulated by means of a moveable mirror. Axial movement of the mirror corresponding to half-wavelengths of laser radiation produced intensity maxima and minima. This modulation concept was extended to pressure measurement by attaching the mirror to a pressure sensing diaphragm. (Author)

COM-73-11416/7GA Reprint
Missouri Univ., Rolla. Graduate Center for Cloud Physics Research.
A COMPARATIVE STUDY OF AITKEN NUCLEI COUNTERS,
V. K. Saxena, D. J. Alofs, A. C. Tebelak, and P. A. Allee. 1972, 12p NOAA-73081707
Contract N00014-68-A-0497
Summary in French Prepared in cooperation with National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.
Pub. in Jnl. de Recherches Atmospheriques, v6 nl/3, p495-505 Jan-Sep 72.

Descriptors: (*Particles, *Detectors), (*Aerosols, Detectors), (*Air pollution, Detectors), Comparison, Sodium iodides, Silver iodide.
Identifiers: *Air pollution detection.

A comparison was made between the readings of different Aitken nuclei counters sampling the same aerosol over a wide range of concentration. In general, the concentration measured by other counters was lower than that given by UMRAC for the same aerosol sample. However, the maximum deviations were within one order of magnitude and were recorded for AgI aerosol. These deviations depend on both the concentration and composition of the test aerosol, but no definite trend could be established with respect to either of them. A plausible explanation for these low counts is suggested in terms of diffusion losses of aerosol particles and the supersaturation decrement within the counter. (Modified author abstract)

COM-73-50730/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
REVISION OF THE STANDARD REFERENCE DATA FOR THERMOCOUPLES.
Final rept.,
Robert L. Powell. 1971, 6p
Sponsored in part by National Aeronautics and Space Administration, Cleveland, Ohio.
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C., 21-24 Jun 71, v4 pt3 p1579-1584.

Descriptors: (*Thermocouples, Standards), Tables(Data).

Revision of the International Practical Temperature Scale requires that there be changes for all accurately tabulated thermophysical values. Revised reference data for thermocouples have been generated in a cooperative program between groups of the National Bureau of Standards in Boulder and Gaithersburg. The new reference data reflect not only revisions in the temperature scale, but also slight changes in the materials themselves and improvements in data fitting methods. A new NBS Monograph that contains tables, analytic expressions, various approximations, and explanatory text has been prepared. A general discussion of the project and some specific examples will be given.

COM-73-50731/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MEASURING TRANSIENT HIGH TEMPERATURES BY OPTICAL PYROMETRY.
Final rept.,
Ared Cezairliyan. 1971, 8p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C., 21-24 Jun 71, v4 ptl p657-664.

Descriptors: (*Temperature measurement, *Optical pyrometers), High temperature tests.

Various pyrometric (optical) methods, using photoelectric and photographic detectors, are described for measuring high temperatures. Emphasis is placed on techniques of measuring transient temperatures of solids above approximately 1500 K with subsecond (upper millisecond to upper microsecond) resolution. Advantages and limitations of the various methods are discussed and estimates of uncertainties are given. Examples of application of the high-speed temperature measurement methods to various fields of investigations, including determination of thermophysical properties, is presented.

COM-73-50737/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE HIGH TEMPERATURE STABILITY OF PLATINUM RESISTANCE THERMOMETERS.
Final rept.,
Richard L. Anderson. 1971, 8p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C. 21-24 Jun 71, v4 pt2 p927-934.

Descriptors: (*Resistance thermometers, Platinum), High temperature tests, Stability, Single crystals.

Some of the chemical and physical parameters that affect the stability of platinum resistance thermometers have been studied, particularly at temperatures near the gold point (1064C). A simplified form of resistance thermometer sensor was designed to aid in these studies. The new design, designated as the steeple, allowed the fabrication of some thermometers from single crystals. Measurements were made of the resistance at the triple point of water after the thermometers had been held above 1000C for extended periods. Further information on the aging of platinum wires at high temperatures was obtained with the scanning electron microscope. Some of the results are shown to be applicable to standard resistance thermometers when used above 400C.

COM-73-50738/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE FITTING OF RESISTANCE THERMOMETER DATA BY ORTHOGONAL FUNCTIONS.
Final rept.,
R. L. Powell, William J. Hall, and J. G. Hust. 1971, 9p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C. 21-24 Jun 71, v4 pt2 p1423-1431.

Descriptors: (*Resistance thermometers, Orthogonal functions), Algorithms, Numerical analysis, Data processing.

Analyses of highly accurate thermal data require sophisticated fitting methods to that expensively obtained experimental precision will not be negated by inadequate mathematical techniques. The article describes fitting methods using orthogonal functions that have been used for several years to fit many types of data, including germanium resistance curves. The method is a generalization and extension of ideas suggested earlier by Lanczos for fitting noisy data. The method usually cleanly separates noise from the fundamental signal in a straightforward manner, allowing one to avoid either an oscillating overfit or an inaccurate underfit. The procedure consists of five parts: Transformation of variables so that the curve is as linear as possible in the transformed variables; weighting of data to satisfy the Gauss-Markov conditions with the weighting function inversely proportional to the experimental variance; orthogonal function generation and coefficient determination using Gram-Schmidt type algorithms developed by Bjorck; separation of noise coefficients from the fundamental signal coefficients based on their different dependence on the number of terms; calculation of smoothed data using the proper number of coefficients.

COM-73-50742/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTERCOMPARISON OF THE IPTS 68 ABOVE 1064C BY FOUR NATIIONAL LABORATORIES.
Final rept.,
R. D. Lee, H. J. Kostkowski, T. J. Quinn, P. R. Chandler, and T. P. Jones. 1971, 17p 1309B%
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C., 21-24 Jun 71.

Descriptors: (*Temperature measurement, Comparison), (*Temperature, *Standards), Melting points, Temperature measuring instruments, Gold.
Identifiers: International temperature scale.

The International Practical Temperature Scale above the melting point of gold, as realized and maintained with high precision photoelectric pyrometers at NBS, NPL, NSL, and PTB, has been intercompared. Six specially selected tungsten strip lamps, four vacuum and two gas, were used in the intercomparison. Determinations were made at a number of brightness temperatures from 1064 to 1700C and at 2200C with the laboratories agreeing to within a few tenths of a degree up to 1700C and 2.0C at 2200C.

COM-73-50743/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE USE OF SUPERCONDUCTORS TO PROVIDE FIXED POINTS ON A CRYOGENIC TEMPERATURE SCALE.
Final rept.,
J. F. Schooley, and R. J. Soulen, Jr. 1971, 6p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C. 21-24 Jun 71.

Descriptors: (*Temperature measurement, Cryogenics), (*Superconductors, Transition temperature), Transition points, Lead, Indium, Aluminum, Zinc, Cadmium.
Identifiers: Standard reference materials.

It is suggested that reproducible superconductive transition temperatures be used as fixed points for temperature scales below 10K. The superconductive transitions of lead, indium, aluminum, zinc, and cadmium have been found to be as narrow as one millikelvin and reproducible to less than one millikelvin. It is planned that devices incorporating these elements will be made available through the NBS Office of Standard Reference Materials.

COM-73-50744/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CALORIMETRIC MEASUREMENT OF THERMODYNAMIC TEMPERATURES ABOVE OC USING TOTAL BLACKBODY RADIATION.
Final rept.,
D. C. Ginnings, and M. L. Reilly. 1971, 10p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C., 21-24 Jun 71.

Descriptors: (*Temperature measurement, Calorimeters), Blackbody radiation.

Using the Stefan-Boltzmann law, a thermodynamic temperature can be determined by measuring

the ratio of blackbody radiation at the unknown temperature to that at the triple point of water. This measurement requires no knowledge either of radiation constants or of geometry. For the above measurements, there has been developed a heat-flow calorimeter operating at liquid helium temperatures in which extremely small powers can be accurately measured. The radiant power absorbed by the calorimeter is measured by substituting known electrical power; if these powers are equal the substitution results in no change in the temperature of the calorimeter. The calorimeter was originally intended for measuring the thermodynamic temperature of the melting point of gold, but as a check on its performance, measurements are being made of the ratio of radiation at 100C to that of OC (IPTS-68). Performance tests show the calorimeter to be sensitive to a change of about 0.002C in the temperature of the radiator with the chosen aperture system. There is now in progress an investigation of possible errors of the measurements, including any effect of diffraction.

COM-73-50751/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
COMMENT ON: HOW TO MOUNT A PELLIN-BROCA PRISM FOR LASER WORK.
Final rept.,
J. Reader. 1973, 1p
Pub. in Applied Optics, v12 n7 p1405 Jul 73.

Descriptors: (*Spectrometers, Optical prisms), Mountings.

It is shown that a recently published mounting for constant deviation prisms is equivalent to one published in 1917. An example of the use of this mounting for a plane grating spectrograph at NBS is given.

COM-73-50752/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STUDIES OF THE PERFORMANCE OF W-RE TYPE THERMOCOUPLES.
Final rept.,
G. W. Burns, and W. S. Hurst. 1971, 16p
Sponsored in part by National Aeronautics and Space Administration, Cleveland, Ohio.
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D. C., 21-24 Jun 71.

Descriptors: (*Thermocouples, High temperature tests), Tungsten, Rhenium, Wire, Electric potential, Beryllium oxides, Insulation, Ductility, Microstructure.

The effect of exposure of bare-wire and BeO-insulated commercial W-Re thermocouple materials to high temperatures in gaseous environments was investigated. The temperature range of interest was primarily 2000 to 2400 K, and the investigations were confined to thermocouple wires of 0.25 mm diameter.

COM-73-50769/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CALORIMETER FOR LASER ENERGY MEASUREMENTS.
Final rept.,
Merritt M. Birky. 1971, 4p
Pub. in Applied Optics, v10 n1 p132-135 Jan 71.

Descriptors: (*Calorimeters, Design), Laser beams, Energy.
Identifiers: Neodymium lasers, Ruby lasers.

A calorimeter enclosed in a constant temperature environment has been constructed to measure the output energy of a conventional mode ruby or neodymium laser. The calorimeter was designed according to the measurement theory and has an estimated uncertainty of plus or minus 2% in the range 3J to 100J. The time-temperature curves were analyzed according to the theory with the aid of a computer program.

COM-73-50773/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A NON-CONTACTING LENGTH COMPARATOR WITH 10 NANOMETER PRECISION.
Final rept.,
A. W. Hartman, F. W. Rosberry, and J. Arol Simpson. 1973, 7p
Pub. in Opt. Eng., v12 n3 p95-101 May/Jun 73.

Descriptors: (*Comparators, Design), Performance evaluation, Resolution, Range(Extremes).

A non-contacting length comparator using two specially designed photo-electric microscopes has been constructed. Performance tests of this comparator, using lapped and polished steel surfaces demonstrate a resolution of approximately 1 nanometer, a precision of approximately 10 nanometers, and a linear range in excess of 50 micrometers.

COM-73-50775/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A PRECISION PHOTOELECTRIC AZIMUTHAL POLARIMETER.
Final rept.,
William Bruce Olson. 1973, 4p
Pub. in Opt. Eng., v12 n3 p102-105 May/Jun 73.

Descriptors: (*Polarimeters, Design), Performance evaluation, Signal to noise ratio.

A high precision photoelectric azimuthal polarimeter has been designed and constructed. The instrument is designed to determine the angle of rotation with an accuracy (3 sigma) of better than 1 part in 10,000. The instrument is of a relatively compact design and quite simple in construction.

COM-73-50780/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CALIBRATION OF CAPSULE PLATINUM RESISTANCE THERMOMETERS AT THE TRIPLE POINT OF WATER.
Final rept.,
Larry L. Sparks, and Robert L. Powell. 1971, 7p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D.C. 21-24 Jun 71, pt2 p1415-1421.

Descriptors: (*Resistance thermometers, Calibrating), Platinum.

Temperature determinations by means of a platinum resistance thermometer, both above and below the triple point temperature of water, depend upon an accurate value for the resistance at the triple point, 0.01%C. A good general methodology for making such a determination was described by H. F. Stimson at the 1955 Temperature Symposium. However, several aspects of the method must be refined or modified for accurate measurements on capsule thermometers. Some of the effects that must be carefully controlled in order to guarantee high precision are: (1) thermal resistance between the thermometer and the freezing interface; (2) thermal conductance down to the thermometer from the ambient environment; (3) high-resistance electrical leakage between leads in the heat exchange fluid; and (4) freezing conditions in the triple point cell itself. Using the procedures developed during the test program, the authors have been able to obtain reproducibilities and statistical imprecisions of about 10 micro-ohms or 100 micro K.

COM-73-50782/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
APPLICATION OF PRECISE HEAT-CAPACITY DATA TO THE ANALYSIS OF THE TEMPERATURE INTERVALS OF THE INTERNATIONAL PRACTICAL TEMPERATURE SCALE OF 1968 IN THE REGION OF 90 K.
Final rept.,
George T. Furukawa, and Martin L. Reilly. 1971, 10p
Pub. in Proceedings of Symposium on Temperature, Its Measurement and Control in Science and Industry (5th), Washington, D. C., 21-24 Jun 71, 10p.

Descriptors: (*Temperature measurement, Standards), Specific heat.

Precise heat-capacity data were employed to analyze the temperature intervals or smoothness of the International Practical Temperature Scale of 1968 (IPTS-68) between 15 and 380K, particularly in the region of 90K, as it is maintained at the National Bureau of Standards. Results show that there are no local irregularities in the temperature scale within the precision (plus or minus 0.02 percent) of the heat-capacity data between 40 and 380K. Below 40 to 15K the uniformity of the temperature scale is less certain because of the lower precision of the heat-capacity data in the temperature range.

COM-73-50788/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SEMIAUTOMATED DATA-RECORDING AND CONTROL SYSTEM FOR AN ELECTRON ENERGY ANALYZER.
Final rept.,
C. J. Powell. 1973, 3p
Contract AT(49-2)-1165
Pub. in Review of Scientific Instruments, v44 n8 p1031-1033 Aug 73.

Descriptors: (*Electron energy, Laboratory equipment), Electron scattering, Aluminum, Tungsten, Automatic, Liquid metals, Auger electrons.
Identifiers: Auger electron spectroscopy, *Electron energy analyzers.

A description is given of a digital data-recording and control system that has been used with a high resolution low energy electron scattering apparatus for the measurement of characteristic electron energy-loss spectra and Auger-electron spectra of solids (at room and elevated temperatures) and liquids. This system is based on a multichannel analyzer and has the following features: (a) specimens can be prepared many times with data accumulated in arbitrarily short times after preparation (prior to specimen contamination), and final spectra of high precision can be obtained by summation of individual runs; (b) the voltage sweep applied to the electron energy analyzer can be calibrated dynamically; and (c) data can be accumulated and the target heated by electron bombardment in a cyclic manner with variable accumulation and heating periods. Characteristic loss spectra of tungsten at 800C and of liquid aluminum are presented as examples of operation of the system.

COM-73-50794/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A REEVALUATION OF THE FUNDAMENTAL PHYSICAL CONSTANTS.
Final rept.,
E. Richard Cohen, and B. N. Taylor. 1972, 21p
Sponsored in part by Rockwell International, Thousand Oaks, Calif.
Pub. in Proceedings of International Conference on Atomic Masses and Fundamental Constants (4th), Teddington, England, 3-7 Sep 71, 21p.

Descriptors: (*Fundamental constants, Evaluation), Least squares method.

The paper is a progress report on the author's efforts to revise and update the comprehensive review of the fundamental physical constants by Taylor, Parker, and Langenberg, including their set of best or recommended values. That such an updating is necessary just two years after their review appeared is due to the extraordinary amount of new experimental and theoretical work which has since been completed. Here, the authors very briefly summarize the experimental and theoretical evidence, with emphasis on the new results which have become available within the

last two years, and discuss various treatments of the data. However, no new set of recommended constants is given since such a set will necessarily require the inclusion of the new data which has become available at this Conference.

COM-73-50795/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE IDEAL GAS-CALORIMETRIC THERMOMETER.
Final rept.,
Lester Haar. 1972, 4p
Pub. in Science, v176, p1293-1296, 23 Jun 72.

Descriptors: (*Temperature measuring instruments, *Ideal gas), (*Standards, Temperature measuring instruments), Heat capacity, Calorimetry, Ammonia, Thermodynamic properties, Temperature.

A new thermometer is suggested for probing the difference between the thermodynamic temperature scale and a practical scale, say the International Practical Temperature Scale--1968. The method is based on the fact that the fractional difference of the heat capacity as measured on two scales is very nearly equal to the temperature derivative of the difference in hotness between the scales. Now, the heat capacity on the thermodynamic scale is by definition that of the ideal gas calculated from the molecular structure using statistical mechanics. This is compared with the analogous quantity measured calorimetrically and extrapolated to the ideal gas limit. The feasibility of the method is illustrated using very accurate data for gaseous ammonia.

COM-73-50801/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FAR ULTRAVIOLET SPECTRAL RADIANCE CALIBRATIONS AT NBS.
Final rept.,
W. R. Ott, and W. L. Wiese. 1973, 9p
Sponsored in part by National Aeronautics and Space Administration, Hampton, VA.
Pub. in Opt. Eng., v12 n3 p86-94 May/Jun 73.

Descriptors: (*Far ultraviolet radiation, *Radiometry), (*Arc lamps, Radiometry), (*Light sources, Standards), Hydrogen, Mercury lamps. Deuterium, Reviews.

The range of NBS radiometric calibration services has been extended into the far ultraviolet region of the spectrum where a dc high power hydrogen wall-stabilized arc is used as a primary standard of spectral radiance. A capability in the range 130 nm to 360 nm (overlapping conventional tungsten strip lamp radiometry) is presently available with estimated uncertainties between 5 and 10 percent depending upon wave-length. The status of radiometric source standards in the far ultraviolet is briefly reviewed and the hydrogen arc and NBS calibration facility are described in detail. The use of commercially available mercury Krefft-Rossler lamps and deuterium arc lamps as transfer or secondary standards is discussed and the spectra of these lamps calibrated with the hydrogen arc standard are presented.

COM-73-50803/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
EFFECTS OF MISALIGNMENT ON THE PRE-MACROYIELD REGION OF THE UNIAXIAL STRESS-STRAIN CURVE.
Final rept.,
Bruce W. Christ. 1973, 5p
Sponsored in part by Naval Air Systems Command, Washington, D.C.
Pub. in Metallurgical Transactions, v4 p1961-1965 Aug 73.

Descriptors: (*Strain gages, Alignment), Bending, Stress strain diagrams, Loads(Forces), Alloys.
Identifiers: Titanium alloy 6AL 4 V, Steel 4340.

Some bending usually occurs in uniaxial testing systems due to small unavoidable misalignment. The resulting elastic strain gradient can lead to significant differnece between axial strain and extreme surface bending strains, especially at small strains. A three-point microstrain measurement around a cylindrical sample permits evaluation of the extreme strains and of the precision of alignment. A three-point, parallel-plate capacitance strain gage having a linear output with designed to evaluate bending of tensile samples in the microstrain range. Analysis of the mechanics of bending in uniaxial loading demonstrated that: the average applied stress divided by the average elastic strain always gives a unique number, Young's modulus, and the average microplastic strain is not uniquely related to the average applied stress, but depends upon precision of alignment. The influence of bending on the determination of the average stress at which microplastic flow initiates is discussed, and a method for making meaningful comparisons of plastic microstrain data generated with significant misalignment is suggested.

COM-73-50816/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
VUV RADIOMETRY WITH HYDROGEN ARCS. 1: PRINCIPLE OF THE METHOD AND COMPARISONS WITH BLACKBODY CALIBRATIONS FROM 1650 A TO 3600 A.
Final rept.,
W. R. Ott, P. Fieffe-Prevost, and W. L. Wiese. 1973, 12p
Sponsored in part by National Aeronautics and Space Administration, Washington, D.C.
Pub. in Applied Optics, v12 n7 p1618-1629 Jul 73.

Descriptors: (*Arc lamps, Hydrogen), (*Radiometry, *Far ultraviolet radiation), (*Radiometers, Standards), Emission, Blackbody radiation, Emissivity.

A method is described that utilizes the continuum emission from a wall-stabilized arc discharge as a radiometric standard in the vuv. Ultimately, this standard will cover the wavelength range from 500 A to 3600 A. Results of a first experiment comparing this method to two other calibration methods in the region above 1650 A are presented. The hydrogen arc method depends upon the fact that the continuum emission coefficient for a hydrogen plasma at typical arc temperatures of about 14,000 K is calculable to within a few percent since the essential spectroscopic constants, continuum absorption coefficients, and transition probabilities are exactly known. The accuracy of the method depends primarily on the capability of spatially resolving in an end-on measurement the nearly homogeneous plasma layers near the axis of the cylindrically symmetric arc column.

CONF-721010-84/GA PC$3.00/MF$1.45
PHOTOELECTRIC EFFICIENCY IN THE RECORDING OF GAMMA RADIATION AND THE LIMITS OF DETECTION OF ELEMENTS BY ACTIVATION ANALYSIS USING A GE(LI) SPECTROMETER.
L. L. Pelekis, Z. Eh. Pelekis, and I. Ya. Taure. 1972, 18p
In Russian. U.S. Sales Only.

Descriptors: (*Activation analysis, *Sensitivity), Efficiency, Gamma spectra, Geometry, Li-drifted ge detectors, Peaks, Performance.

For abstract, see NSA 28 02, number 02113.

EUR-4886/GA PC$7.50/MF$1.45
European Communities, Luxembourg. Commission.
COMMUNITY SURVEY ON STANDARD REFERENCE MATERIALS.
Mar 73, 106p
U.S. Sales Only.

Descriptors: (*Calibration standards, *European communities), Information, Specifications, Standardized terminology, Standards.

For abstract, see NSA 28 03, number 07620.

JPRS-59951/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
PHOTELECTRONIC AND THERMOELECTRONIC INSTRUMENTS AND THEIR APPLICATIONS,
S. V. Mayorov. 4 Sep 73, 25p
Trans. of mono. Fotoelektronnye i Termoelektronnye Pribory i ikh Primenenie, Moscow, 1973 p20-37, 155-157.

Descriptors: (*Electronic test equipment, Electrooptics), (*Photomultiplier Tubes, Reviews), (*Photoelectric cells, Reviews), (*Television transmitters, Reviews), Iconoscopes, Photocathodes, Image converters, Infrared image tubes, Automation, Translations, U.S.S.R, Production control.

The report contains descriptions of the design and physical principles of operation of various photoelectronic and thermoelectronic instruments including multipliers, transmitting television tubes and image converters.

N73-27382/3GA PC$0.75/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Lab.
A THREE-STATION LIGHTNING DETECTION SYSTEM.
L. H. Ruhnke. Jul 72, 46p NASA-CR-133400, NOAA-TR-ERL-239-APCL-23
NASA ORDER C-59753-C

Descriptors: *Atmospheric electricity, *Electric fields, *Ground stations, *Lightning, *Magnetic fields, Data acquisition, Equipment specifications, Position (Location), Radio direction finders.

For abstract, see STAR 1118

N73-27390/6GA PC$11.25/MF$1.45
National Bureau of Standards, Boulder, Colo.
MASS QUANTITY GAUGING BY RF MODE ANALYSIS.
Interim Report.
R. S. Collier, D. Ellerbruch, J. E. Cruz, R. W. Stokes, and P. E. Luft. Jun 73, 184p NASA-CR-133393, NBSIR-73-318
NASA ORDER T-1738-B

Descriptors: *Cavity resonators, *Gauge invariance, *Mass flow, *Propellant tanks, *Radio frequencies, Hydrogen, Nitrogen, Resonant frequencies, Space shuttle orbiters.

For abstract, see STAR 1118

N73-27392/2GA PC$3.00/MF$1.45
Texas Univ., Austin. Dept. of Astronomy.
INFRARED SITE MONITOR OPERATIONS AT MCDONALD OBSERVATORY.
Final Report.
H. J. Smith. 16 Apr 73, 3p NASA-CR-133394
Contract NGR-44-012-202

Descriptors: *Infrared instruments, *Observatories, Calibrating, Logistics, Maintenance.

For abstract, see STAR 1118

N73-27703/0GA PC$3.25/MF$1.45
National Aerospace Lab., Tokyo (Japan).
ON THE ULTRASONIC INSPECTION OF SEPARATION IN SOLID PROPELLANT ROCKET MOTORS.
M. Shimizu, Y. Noguchi, and T. Tanemura. Dec 72, 21p NAL-TR-308

In Japanese; English Summary.

Descriptors: *Forming techniques, *Nondestructive tests, *Rocket engine cases, *Solid propellant rocket engines, *Ultrasonic radiation, *Ultrasonic tests, Quality control, Reliability analysis, Rocket linings, Voids.

For abstract, see STAR 1118

N73-27740/2GA PC$3.00/MF$1.45
Royal Greenwich Observatory, Herstmonceux (England). Time and Latitude Service.
GREENWICH TIME REPORT, APRIL-JUNE 1972.
Jun 72, 14p

Descriptors: *Latitude, *Radio astronomy, *Universal time, Frequency standards, Radio signals.

For abstract, see STAR 1118

N73-28133/9GA PC$10.75/MF$1.45
Gesellschaft fuer Weltraumforschung m.b.H., Porz (West Germany).
FACILITIES FOR SPACE PROJECTS: VOLUME 1: FACILITIES FOR ENVIRONMENTAL TESTS ANLAGEN FUER RAUMFLUGPROJEKTE. BAND 1: ANLAGEN ZUR UMWELTERPROBUNG.
Oct 72, 174p
Language in German.

Descriptors: *Germany, *Space environment simulation, *Test facilities, *Thermal simulation, Data processing, Dynamic tests, Electromagnetic measurement, Thermal vacuum tests.

For abstract, see STAR 1119

N73-28437/4GA PC$3.00/MF$1.45
Royal Greenwich Observatory, Herstmonceux (England).
GREENWICH TIME REPORT: TIME AND LATITUDE SERVICE, OCTOBER - DECEMBER 1972.
Dec 72, 17p

Descriptors: *Latitude measurement, *Tables (Data), *Time measurement, Periodic variations, Radio signals.

For abstract, see STAR 1119

N73-28517/3GA PC$3.25/MF$1.45
Southwest Research Inst., San Antonio, Tex.
NONDESTRUCTIVE TESTING: A SURVEY.
1973, 283p NASA-SP-5113, LC-72-600247
Subm-Sponsored by NASA.

Descriptors: *Nondestructive tests, *Technology utilization, Defects, Eddy currents, Infrared detectors, Penetrants, Radiography, Ultrasonic tests.

For abstract, see STAR 1119

N73-28622/1GA PC$4.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
COST ANALYSIS OF ATMOSPHERE MONITORING SYSTEMS.
M. M. Yakut. 31 May 73, 37p NASA-CR-124331, MDC-G4580
Contract NAS8-28377

Descriptors: *Atmospheric composition, *Cost analysis, *Monitors, Air pollution, Cost estimates, Gas chromatography, Mass spectrometers.

For abstract, see STAR 1119

PAT-APPL-289 906/GA PC$3.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
AUTOMATIC PHOTOMULTIPLIER TUBE VOLTAGE CONTROLLER.
Patent Application,
Wayne F. Johnson. Filed 18 Sep 72, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Photometers, *Patent applications), (*Voltage regulators, Photomultiplier tubes), Feedback circuits.
Identifiers: PAT-CL-356-179.

The object of the patent application is to provide a system for maintaining the water blank output signal amplitude from a GeMSAEC analytical photometer constant during operation thereof. The object is accomplished by providing a feedback circuit which samples the amplitude of the water blank output signal of the above photometer by means of a fast-acting solid state switch. It assures that the water blank signal amplitude remains constant by controlling the photomultiplier tube high voltage supply following comparison of the water blank transmission signal with a very well regulated reference voltage.

PAT-APPL-295 780/GA PC$3.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
COMPACT DYNAMIC MULTISTATION PHOTOMETER UTILIZING DISPOSABLE CUVETTE ROTOR.
Patent Application,
Norman G. Anderson, Carl A. Burtis, Wayne F. Johnson, James C. Mailen, and Charles D. Scott. Filed 6 Oct 72, 17p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Photometers, *Patent applications), Rotors, Apertures, Synchronism.
Identifiers: PAT-CL-250-218.

The patent application describes a compact analytical photometer of the rotary cuvette type designed to use small disposable cuvette rotors. A power driven cuvette rotor holder having a generally flat, circular configuration is provided with an integral, upstanding, annular lip for receiving, in an easily insertable and removable fashion, small disposable cuvette rotors. A series of axially extending apertures are disposed in a circular array through the rotor holder in axial alignment with respective cuvettes in the rotor to permit light to be transmitted through the cuvettes as the rotor holder and cuvette rotor rotate between a stationary light source and photodetector. Additional apertures extend through the rotor holder near its periphery to permit light passage through the rotor holder for rotor and cuvette synchronization purposes. Movable rotor and cuvette synchronization detectors are positioned along the periphery of the rotor holder for generating signals which are used to synchronize the photometer output with a computer and to provide rotor speed control.

PAT-APPL-374441/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MULTIPLATE FOCUSING COLLIMATOR.
Patent Application.
R. B. Hoover, and J. H. Underwood. Filed 28 Jun 73, 13p NASA-CASE-MFS-20932-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Collimators, *Electromagnetic radiation, *High resolution, *Neutrons, *Optical scanners, Energy distribution, Focusing, Optical equipment, Patent applications.

An apparatus for scanning relatively small near sources of radiation to obtain the energy distribution wherein a collimator assembly is interposed between a radiation source and a radiation detector is described. The collimator assembly has a plurality of plates aligned in parallel planes with respect to a common axis normal to their centers which have a similar random distribution of apertures, with the apertures of each plate being the same size. The size of respective plates, the size of the apertures of the respective plates, and the spacing between respective plates vary precisely according to a predetermined ratio to produce radiation channels which converge to a focal point through corresponding ones of the similar random distribution of apertures of the plates. The radiation incident to the radiation detector is maximized when the focal point and the radiation source are coincident.

PAT-APPL-379019/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WIND TUNNEL FLOW GENERATION SECTION.
Patent Application.
N. E. Sorensen. Filed 13 Jul 73, 16p NASA-CASE-ARC-10710-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Flow velocity, *Uniform flow, *Wind tunnels, Patent applications, Porous walls, Wind tunnel walls.

An apparatus for generating acceptably uniform flow for the test section of a wind tunnel over a range of different flow velocities. More particularly, it has been found that by appropriately adjusting the length of the porous wall surfaces in the flow generation section of the wind tunnel to which a negative pressure is applied and by applying appropriate negative pressures, the flow through the test section of the wind tunnel can be made uniform. In its basic aspects, therefore, the apparatus comprises a pair of generally opposed, porous wall surfaces defining the flow generation section, means for selectively applying appropriate negative pressures to the exterior sides of such porous wall surfaces, and means for selectively varying the length of such wall surfaces to which the negative pressure is applied.

PAT-APPLN-382261/GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
STRAIN GAGE MOUNTING ASSEMBLY.
Patent Application.
R. H. Silver, and S. H. Kalfayan. Filed 24 Jul 73, 15p NASA-CASE-NPO-13170-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Deformeters, *Mechanical measurement, *Strain gages, *Stress measurement, Equipment specifications, Patent applications, Test equipment.

A mounting assembly which can amplify the measurable strain deformation applied to a strain gage is described. The construction and operation of the equipment are described. The mounting assembly is of particular value in monitoring the internal pressure of corrosion resistant containers such as glass. The technique permits monitoring objects where small deformations could lead to failure in order to prevent excessive stress.

PATENT-3,744,294/GA Not available NTIS
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
ACOUSTICAL TRANSDUCER CALIBRATING SYSTEM AND APPARATUS.
Patent.
T. L. Lewis, and R. B. Cohn. Patented 10 Jul 73, 5p NASA-CASE-FRC-10060-1,
Misc-Filed 14 Oct. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Acoustic properties, *Transducers, Actuators, Patents, Pressure chambers.

An acoustical transducer calibrating system includes a differential pressure actuating device having an inner chamber for applying differential pressures to the transducer, and an outer chamber for vacuum sealing. Mounted within the inner chamber is an electrostatic actuator for exciting the transducer at selected frequencies so that its sensitivity can be determined for different operating ambient pressures.

PATENT-3 198 994/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SUPERCONDUCTIVE MAGNETIC-FIELD-TRAPPING DEVICE.
Patent.
A. F. Hildebrandt, D. D. Elleman, and F. C. Whitmore. Patented 3 Aug 65, 3p NASA-CASE-XNP-01185,
Misc-Filed 29 Nov. 1961. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Air, *Magnetic fields, *Plasma control, *Superconductivity, Magnetic flux, Patents.

An apparatus which enables the establishment of a magnetic field in air that has the same intensity as the ones in ferromagnetic materials is described. The apparatus is comprised of a core of ferromagnetic material and is surrounded by a cylinder made of a material that has superconducting properties when cooled below a critical temperature. A method is provided for producing a magnetic field through the ferromagnetic core. The core can also be split and pulled apart when it is required that the center of the cavity be left empty.

PATENT-3 673 871/GA Not available NTIS
Department of the Air Force Washington D C
PORTABLE LIQUID GAS SAMPLER SYSTEM.
Patent,
Walter N. Randle, Howard H. Spieth, and William D. English. Filed 28 Jun 71, patented 4 Jul 72, 6p Rept nos. PAT-APPL-157 140,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Liquefied gases, *Samplers), (*Patents, Samplers), Cryogenics, Analysis, Impurities, Valves, Mobile, Safety valves, Quality control.
Identifiers: PAT-CL-73-421-R.

The invention relates generally to a means for sampling cryogenic fluids and more particularly to a means for obtaining a cryogenic sample of liquid gases and trapping and separating the particulate contained in the sample. The sampler is a self-contained, portable apparatus needing only certain utility connections required for operation. It is packaged in an aluminum case and is provided with a removable section containing a control panel for semi-remote operation. The sampler parts and instrument panel can slide out as a unit from the other section of the case. The entire unit is supported on a dolly with semi-pneumatic rubber tires and handles arranged for transporting the unit.

PATENT-3 677 065/GA Not available NTIS
Department of the Air Force Washington D C
TRANSPARENT FLUID SAMPLER PERMITTING PARTICULATE ANALYSIS IN AN ASSEMBLED CONDITION.
Patent,
James G. Davis. Filed 14 Oct 70, patented 18 Jul 72, 5p Rept nos. PAT-APPL-80 704,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Samplers, *Liquids), (*Filters(Fluid), Samplers), (*Patents, Samplers), Particle size.
Identifiers: PAT-CL-73-28.

The invention permits the obtaining of a precise particulate analysis of a fluid sample without the need for a controlled clean room environment. The principal object of this invention is to provide apparatus for a precise particulate analysis of a fluid while the apparatus is in an assembled condition; and, thereby, permits the particulate analysis to be performed in any convenient location. A related object is to allow the indefinite retention of a particulate sample in its own sealed environment. Another related object is to allow packaging of a sterilized filter disc in a holder which does not require subsequent opening or reopening.

PATENT-3 677 079/GA Not available NTIS
Department of the Air Force Washington D C
COMBINED STEADY-STATE/DYNAMIC TOTAL HEAD PROBE.
Patent,
Richard P. Hoeflinger. Filed 21 May 70, patented 18 Jul 72, 7p Rept nos. PAT-APPL-39 350,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Pressure gages, *Patents), (*Supersonic wind tunnels, Pressure gages), Sensors, Probes, Subminiature electronic equipment, Diaphragms(Mechanics).
Identifiers: PAT-CL-73-147.

The patent relates to a combined, coaxial probe unit including a diffused diaphragm pressure tranducer sensor device positioned within a larger outer tube and mountable within a wind tunnel test model for measuring both inlet total head and static pressure. The sensor device is miniaturized and incorporates built-in protection against impact damage from contaminants in the stream flow by means of an integral baffle plate located in the tip of the probe unit immediately upstream from the sensor device.

PATENT-3 700 338/GA Not available NTIS
Office of the Secretary of the Army Washington D C
LIGHT SCATTERING CELL.
Patent,
Albert S. Trundle. Filed 9 Jun 70, patented 24 Oct 72, 4p Rept nos. PAT-APPL-44 835,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Optical equipment, *Light transmission), (*Patents, Optical equipment), Liquids.
Identifiers: PAT-CL-356-246, *Light scattering, Colorimeters, Optical measuring instruments.

The invention relates to a sample-containing cell which is part of the optical system of apparatus used in making light scattering measurements. Liquid samples or particulate samples suspended in a liquid may be placed in the cell. (Author)

PATENT-3 706 227/GA Not available NTIS
Office of the Secretary of the Army Washington D C
PNEUMATIC THERMOMETER.
Patent,
Richard N. Gottron, and Wilmer Gaylord. Filed 27 Mar 63, patented 19 Dec 72, 5p Rept nos. PAT-APPL-268 497,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Thermometers, *Patents), Transducers, Temperature sensitive elements, Oscillators, Pneumatic devices.
Identifiers: PAT-CL-73-339-A.

In the patent a pneumatic thermometer is disclosed having a fluid operated oscillator in which the frequency is sensitive to temperature changes. The oscillator is of an open type and contains a stilling chamber to dampen out the oscillation. The pulses obtainable from the oscillator chambers are fed to a transducer and the output of the transducer is fed to a pulse converter to which a temperature calibrated indicator is connected.

PATENT-3 706 228/GA Not available NTIS
Office of the Secretary of the Army Washington D C
TEMPERATURE AND VELOCITY APPARATUS FOR MOVING FLUIDS.
Patent,
Clarence C. Bush. Filed 5 Jan 71, patented 19 Dec 72, 4p Rept nos. PAT-APPL-103 974,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Temperature sensitive elements, *Patents), (*Anemometers, Patents), (*Gas flow, Temperature), Sensors, Air.
Identifiers: PAT-CL-73-343-R.

In order to measure the temperature and velocity of a high speed stream of a gas such as air, a temperature sensor is placed on the peripheral area of a disc wheel and the disc is positioned in the path of air flow and is spun until its periphery is traveling at the velocity of the air. The sensor, which is described in the patent, when moving downstream, has zero velocity with respect to the fast-flowing air and therefore gives a true reading of the air temperature.

PATENT-3 706 498/GA Not available NTIS
Office of the Secretary of the Army Washington D C
AUTOMATIC BEAM SCANNING APPARATUS FOR EVALUATING OPTICAL BEACONS.
Patent,
Teddy J. Peacher. Filed 23 Apr 71, patented 19 Dec 72, 5p Rept nos. PAT-APPL-136 696,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Optical equipment, *Patents), (*Beacon lights, Measuring devices(Electrical + Electronic)), Electron beams, Energy, Automatic.
Identifiers: PAT-CL-356-121.

An automatic beam scanning apparatus is disclosed in the patent wherein a cylindrical open-ended chamber houses an optical beacon for evaluation. The chamber is rotatable about its longitudinal axis for determining the beacon beam intensity at selectable points off the axis of rotation. The chamber also is traversable in a path which sweeps a beacon beam over a detector. Hence, a predetermined rotate and sweep arrangement allows detection of the spatial energy distribution of the beam of an optical beacon.

PATENT-3 706 865/GA Not available NTIS
Office of the Secretary of the Army Washington D C
ELAPSED TIME INDICATOR.
Patent,
Frank K. Porter, Jr., and Boris Sonjara. Filed 7 Dec 71, patented 19 Dec 72, 4p Rept nos. PAT-APPL-205 586,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Time switches, *Patents), Pistons, Magnetic materials.
Identifiers: PAT-CL-200-83-T.

The invention relates to timing or switching devices and more particularly pertains to elapsed time indicators or time delay switches of the hydromagnetic type wherein the period commences upon release of a piston which is magnetically coupled to a fixed element and moves through a viscous fluid toward the element.

PATENT-3 711 769/GA Not available NTIS
Office of the Secretary of the Army Washington D C
SPURIOUS SIGNALS AND INTERMODULATION PRODUCTS DETECTION ENHANCEMENT CIRCUIT.
Patent,
Murray W. Peake. Filed 9 Mar 71, patented 16 Jan 73, 6p Rept nos. PAT-APPL-122 390,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Noise analyzers, *Patents), Noise(Radio), Measurement, Circuits, Phase shifters.
Identifiers: PAT-CL-324-57-N, Spurious signals.

The patent describes a test system where a fundamental signal is sent through a unit to be tested and at the same time this signal is sent around said unit to be tested and shifted a 180 degrees in phase with respect to output of unit. The two signals are then combined to eliminate the fundamental, and the spurious signal is measured by a spectrum analyzer.

PATENT-3 721 899/GA Not available NTIS
Office of the Secretary of the Army Washington D C
CONTINUITY TEST AND INDICATING CIRCUIT.
Patent,
John T. Haywood. Filed 6 Oct 71, patented 20 Mar 73, 7p Rept nos. PAT-APPL-187 034,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Test equipment(Electronics), *Patents), Modules(Electronics), Switching circuits, Silicon controlled rectifiers.
Identifiers: PAT-CL-324-73-R.

The patented circuit checks the circuitry of modules by the use of a switching device which selectively connects all possible combinations of pairs of terminals of a selected module to a sensing circuit. The sensing circuit enables a selective SCR (Silicon Controlled Rectifier) when there is continuity between the selective pairs of terminals. The enabled SCRs cause a further switching system to be programmed in a binary fashion whereby the switching system will power an indicator to visually show all the connections in the module.

PATENT-3 737 762/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
APPARATUS AND METHOD FOR MEASURING THE SEEBECK COEFFICIENT AND RESISTIVITY OF MATERIALS.
Patent.
V. Hadek. Patented 5 Jun 73, 5p NASA-CASE-NPO-11749,
Misc-Filed 26 Aug. 1971 Supersedes N72-20398 (10 -11, p 1473). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Materials science, *Measuring instruments, *Thermoelectricity, Electrical properties, Electrical resistance, Patents, Pressure effects, Seebeck effect.

An apparatus for measuring the thermoelectric properties of materials under high pressure is described that includes a pair of force transmitting assemblies constructed of thermally and electrically conductive material positioned between the ram and anvil of a press. Each force transmitting assembly has a small diameter pressing portion for contacting a face of the sample so that the sample can be squeezed between them. Each assembly also includes a heat exchanger to maintain the sample face at a controlled temperature, and an electrical conductor to carry current generated by the sample. A sleeve of thermally and electrically insulative material closely surrounds the pressing portions of the two assemblies.

PATENT-3 740 760/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
REACTION END-POINT RECORDER FOR USE WITH A ROTARY ANALYTICAL PHOTOMETER.
Patent,
Wayne F. Johnson, and William R. Miller. Filed 9 Nov 71, patented 19 Jun 73, 7p PAT-APPL-196 900
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Data recorders, *Photometers), (*Patents, Data recorders), Analog systems.
Identifiers: PAT-CL-346-74.

The patent describes an analog data recording system for recording data values from a rotary analytical photometer. The system comprises means for scanning the range of data values, comparing the data values with the instantaneous value of a logarithmic scan voltage and energizing individual marking means that are synchronized with the scan when the voltage value of the scan equals the individual data voltage value.

PATENT-3 741 001/GA Not available NTIS
Litton Systems, Inc., Minneapolis, Minn.
APPARATUS FOR SAMPLING PARTICULATES IN GASES.
Patent.
R. C. Wood. Patented 26 Jun 73, 8p NASA-CASE-HQN-10037-1,
Misc-Filed 20 Mar. 1972 Supersedes N72-27424 (10 -18, P2427). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Atmospheric composition, *Particulate sampling, *Upper atmosphere, Air filters, Equipment specifications, Patents, Test equipment.

A device for sampling particulates in gases is described. The device is used to obtain samples of the upper atmosphere. The equipment used a common source of gas pressure to provide the driving gas of an air ejector pump. The sample collection cylinder has many slit impactors running longitudinally on the outer surface of a cylinder and terminating just short of each end of the cylinder.

PATENT-3 744 320/GA Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PRESSURIZED PANEL.
Patent.
E. C. White. Patented 10 Jul 73, 4p NASA-CASE-XLA-08916-2,
Misc-Filed 6 Nov. 1970. Subm-Continuation-in-Part of US Patent Appl. Sn-777765, Filed 21 Nov. 1968.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Meteorite collisions, *Panels, *Pressure sensors, *Spacecraft structures, Detectors, Patents.

Large area pressurized meteoroid penetration detector panels with maximum inherent structural rigidity are provided. The panels measure directly the penetration rate in materials to be used in spacecraft. Panel structure include an interconnected cellular configuration in which the cells have spaced periphery welds and tufts in their centers. A spot weld is made at the center point joining the panels.

PATENT-3 744 738/GA Not available NTIS
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
ZERO GRAVITY LIQUID TRANSFER SCREEN.
Patent.
F. S. Howard. Patented 10 Jul 73, 5p NASA-CASE-KSC-10626,
Misc-Filed 16 Sep. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Liquid flow, *Weightlessness, Patents, Screens, Transferring.

A liquid transfer device for use in a zero gravity environment, for transferring liquid from one container to another is described. The device includes a spiral shaped screen type member which is carried in the container for collecting the randomly dispersed liquid and transferring such to an exit port.

PATENT-3 745 357/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD AND APPARATUS FOR MEASURING ELECTROMAGNETIC RADIATION.
Patent.
J. F. Been. Patented 10 Jul 73, 4p NASA-CASE-LEW-11159-1,
Misc-Filed 6 Jan. 1971 Supersedes N71-31127 (09 - 18, p 2924).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electromagnetic radiation, *Radiation measuring instruments, Background noise, Patents, Radiant flux density, Semiconductor junctions.

An apparatus and method are described in which the capacitance of a semiconductor junction subjected to an electromagnetic radiation field is utilized to indicate the intensity or strength of the radiation.

PB-223 613/1GA PC$4.75/MF$1.45
Council for Scientific and Industrial Research, Pretoria (South Africa). Chemical Engineering Group.
DETERMINATION OF THE PARTICLE CONTENT OF FLOWING GASES. AN ANNOTATED BIBLIOGRAPHY. 1973 ADDENDUM.
Subject survey,
E. A. Rouillard. May 73, 53p CSIR-SS-O/CHEM-5-Addendum
International Standard Book No. 0 7988 0191 3. See also report dated May 72, PB-211 203.

Descriptors: (*Particles, *Samplers), (*Bibliographies, *Sampling), (*Air pollution, Particles), Monitors, Detectors, Dust, South Africa.
Identifiers: *Air pollution detection.

The bibliography contains references on sampling and monitoring particulate concentrations in flowing gas streams that came to our attention during the past year. It is an addendum to the bibliography, published in May 1972 (PB-211 203).

PB-223 628/9GA PC$3.75/MF$1.45
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
DEVELOPMENT OF IN SITU PROTOTYPE DIODE LASER SYSTEM TO MONITOR SO2 ACROSS THE STACK.
Final rept. Nov 71-Mar 73,
E. David Hinkley. May 73, 77p* EPA-R2-73-218
Contract EPA-68-02-0569

Descriptors: (*Sulfur dioxide, *Gas detectors), (*Air pollution, Gas detectors), (*Flue gases, Gas detectors), (*Monitors, Sulfur dioxide), (*Remote sensing, Sulfur dioxide), Infrared detectors,

Design, Errors, Electric power plants, Wiring diagrams.
Identifiers: *Air pollution detection, *Semiconductor lasers, Tunable lasers.

The report describes the development and testing of a semiconductor diode laser system to monitor sulfur dioxide by differential absorption of infrared radiation. Laser material was prepared and diodes fabricated which would operate in a temperature-independent region of SO2 absorption. Data concerning sensitivity and interferences from aerosols and other gases were recorded in the laboratory. Field tests were then performed at an operating coal-burning power generating station, with the results compared with SO2 measurements taken with a conventional chemical monitor. (Author)

PB-223 654/5GA PC$9.75/MF$1.45
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
EVALUATION OF MEASUREMENT METHODS AND INSTRUMENTATION FOR ODOROUS COMPOUNDS IN STATIONARY SOURCES. VOLUME II, FIELD TESTING.
Final rept. 30 Jun 71-31 Dec 72,
Homer J. Hall. Mar 73, 153p EPA-R2-73-180
Contract EPA-68-02-0219
See also Volume 1, PB-212 812.

Descriptors: (*Inorganic sulfides, *Odor detection), (*Air pollution, *Odors), (*Gas detectors, Odor detection), (*Hydrogen sulfide, Gas detectors), Coulometers, Flame photometry, Gas chromatography, Performance evaluation.
Identifiers: *Air pollution detection.

Three types of commercially available equipment for the analysis of H2S and other odorous sulfides have been evaluated for performance and reliability at stack emission levels of 0.1 to 100 ppm in air. These included coulometers (3 models) flame photometric detectors plus gas chromatography (2 models) and tape sensors with or without a preliminary gas convertor (3 models). None of these instruments is capable of analyzing for H2S in this range in the presence of large amounts of SO2, CO2, CO, COS, and CS2, which may characterize stack emissions from a Kraft paper mill or a petroleum refinery Claus plant. Reasons for these failures are examined, and modifications of presently available equipment are recommended for this purpose.

PB-223 685/9GA PC$3.00/MF$1.45
BIARA-The Corporate Labs. of the British Steel Corp., London (England).
PREPARATION AND PERFORMANCE OF INTER-LABORATORY TRIALS FOR THE ESTIMATION OF PRECISION OF TEST METHODS,
A. A. Greenfield. Aug 73, 13p BISRA-CDL/MT/5/73

Descriptors: (*Experimental design, Statistical analysis), (*Tests, Laboratories), Evaluation, Precision, Great Britain.

The document is a guide to the preparation and performance of an interlaboratory trial whose purpose is to estimate the precision of a single test method after a test procedure has been agreed.

PB-223 689/1GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
ASSESSMENT OF THERMAL ANALYSIS APPARATUS. VISIT TO LINSEIS GMBH SELB GERMANY 11-17 DECEMBER 1972,
I. M. Stephenson, and M. H. Jukes. Aug 73, 7p BISRA-GS/OPER/V/1/73/C

Descriptors: (*Differential thermal analysis, Test equipment), (*Thermal analysis, Test equipment), Extensometers, Evaluation, West Germany, Great Britain, Cesium compounds, Inorganic sulfides.

The report describes work carried out during a visit to Linseis GmbH to assess the value of differential thermal analysis equipment and a high temperature dilatometer. The results obtained on samples of beta-C2S examined on both pieces of equipment were very encouraging. The differential thermal analysis equipment proved to have better resolution, to be more flexible and easier to set up and operate than alternative systems which have been examined. There is no commercially available alternative to the high temperature dilatometer which proved to be very sensitive, easy to operate and was apparently very reliable.

PB-223 731/1GA PC$3.00/MF$1.45
BISRA-The Corporate Labs. of the British Steel Corp., London (England).
THE MEASUREMENT OF PARTICULATE IMMISSIONS AND EMISSIONS,
R. R. Coles, and B. J. J. Shak. Aug 73, 45p* BISRA-CEL/CH/29/73

Descriptors: (*Air pollution, Measuring instruments), (*Particles, *Measuring instruments), Reviews, Detectors, Densitometers, Samplers, Monitors, Dust, Transmissometers, Great Britain.
Identifiers: *Air pollution sampling, Smokemeters.

Regulations on atmospheric pollution in force today insist not only on improved standards of dust control by industry but also require that monitoring of the emissions of grit and dust from steelworks should be carried out to ensure that these improvements are maintained. A large number of instruments which sense particulate emissions are available on the market in the Western World and their principles and representative types have been surveyed in this report, with particular reference to the automatic and continuous measurement of stack emissions. Brief descriptions of selected items of equipment are presented, augmented by comments on their applicability and lists and details of their manufacturers. (Modified author abstract)

SLA-73-362/GA PC$5.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ERROR ANALYSIS OF A BELL-TYPE PROVER FOR USE AS A GAS FLOW RATE STANDARD.
J. L. Hartley. Mar 73, 57p

Descriptors: (*Flowmeters, *Gas flow), Errors, Performance, Standards.

For abstract, see NSA 28 03, number 07785.

SLA-73-5335/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
WATER ENTRY CAVITY PRESSURE MEASUREMENTS.
D. W. Doak, and G. M. Ferguson. 1970, 6p CONF-730607-1

Descriptors: (*Water, Cavities), (*Cavities, *Pressure measurement), Missiles, Very high pressure.

For abstract, see NSA 28 03, number 07792.

SRARI-P-168/GA PC$4.25/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
METHOD OF MEASURING STORED ENERGY IN IRRADIATED MATERIALS.
P. S. Gordienko. 1972, 42p
In Russian. U.S. Sales Only.

Descriptors: (*Solids, *Physical radiation effects), (*Stored energy, *Measuring methods), Bibliographies, Calorimeters, Reviews, Solids.

For abstract, see NSA 28 02, number 03325.

UCID-16240/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SIMPLE SENSOR AND RECORDER FOR FAST CURRENT PULSES.
E. J. Hsieh, K. E. Vindelov, and G. A. Condas. 29 Mar 73, 10p
Contract W-7405-eng-48

Descriptors: (*Electric currents, *Pulses), Films, Magnetic materials, Measuring instruments.

For abstract, see NSA 28 02, number 05073.

UCRL-74515/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
ACOUSTIC EMISSION COINCIDENCE DETECTOR FOR MONITORING HIGH RESIDUAL STRESS AREAS IN SYMMETRICAL PRESSURE VESSELS.
N. R. Sewall. 7 Mar 73, 8p CONF-730510-2

Descriptors: (*Acoustic emission testing, *Pressure vessels), (*Transducers, *Performance), Cracks, Defects, Stresses, Welded joints.

For abstract, see NSA 28 03, number 05481.

UCRL-74549/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
ACOUSTIC EMISSION TECHNIQUES IN NONDESTRUCTIVE TESTING.
R. G. Liptai, and C. A. Tatro. 6 Feb 73, 12p CONF-730606-3

Descriptors: (*Acoustic emission testing, *Reviews), Cracks, Defects, Electronic equipment, Fracture properties, Inspection, Measuring instruments, Performance, Plasticity, Sound waves, Transducers, Uses.

For abstract, see NSA 28 03, number 05482.

14C. Recording Devices

N73-27112/4GA PC$3.00/MF$1.45
Japan Broadcasting Corp., Tokyo.
THERMOMAGNETIC ANALOG RECORDING.
T. Nomura, and K. Yokoyama. Jan 73, 7p NHK-LABS-NOTE-157

Descriptors: *Analog data, *Magnetic recording, *Magnetic tapes, *Signal encoding, Computer storage devices, Feasibility analysis, Laser heating.

For abstract, see STAR 1118

14D. Reliability

CEA-CONF-2221/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
RELIABILITY AND MAINTAINABILITY: TWO IMPORTANT CHARACTERISTICS FOR THE TECHNICAL SUPPORT SERVICES.
C. Guyot. 24 Nov 72, 15p CONF-730120-1
U.S. Sales Only.

Descriptors: (*Electronic circuits, *Maintenance), (*Electronic equipment, Maintenance), Control equipment, Reliability.

For abstract, see NSA 28 02, number 05008.

14E. Reprography

AD-767 800/2GA PC$4.75/MF$1.45
Defense Documentation Center Alexandria Va

MICROFICHE VIEWING EQUIPMENT GUIDE.
3rd. edition,
Ronald F. Gordon. Sep 73, 167p Rept no. DDC-TR-73-2

Descriptors: (*Office equipment + supplies, *Microfiche), Directories, Film readers, Photographic projectors.
Identifiers: *Microfiche viewing equipment, *Microfiche readers, *Microfiche reader printers.

The document is a descriptive directory of microfiche viewers and viewer-printers that are manufactured or distributed in the United States through mid-1973. General evaluation criteria have been outlined to assist the potential buyer. Detailed specifications, features, and photographs are uniformaly listed for each of the 92 models surveyed. (Author)

N73-28502/5GA PC$3.00/MF$1.45
Osservatorio Astronomico, Rome (Italy).
ON THE ACCURACY OF THE SPECTROPHOTOMETRY WITH KODAK IN, IIAO AND IIAD EMULSIONS.
A. Cassatella, and R. Viotti. Nov 72, 16p RR-3

Descriptors: *Accuracy, *Photographic emulsions, *Spectrophotometry, Calibrating, Image contrast, Performance tests, Photosensitivity, Wavelengths.

For abstract, see STAR 1119

N73-28555/3GA PC$11.75/MF$1.45
Radiation, Inc., Ann Arbor, Mich. Harris Electro-Optics Center.
INVESTIGATION OF USES OF HOLOGRAPHIC OPTICAL ELEMENTS.
Final Report, 1 Jun. 1972 - 31 May 1973.
R. G. Zech, and J. Latta. 31 May 73, 192p NASA-CR-124334, REPT-8204-T-1
Contract NAS8-28949

Descriptors: *Aberration, *Holography, *Imagery, Bandwidth, Computerized design, Interferometers, Optical properties.

For abstract, see STAR 1119

PAT-APPL-379290/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MICROSCOPE MULTI-ANGLE, REFLECTION, VIEWING ADAPTOR AND PHOTOGRAPHIC RECORDING SYSTEM.
Patent Application.
A. Fisher, and C. H. Clatterbuck. Filed 16 Jul 73, 11p NASA-CASE-GSC-11690-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Display devices, *Imaging techniques, *Photomicrography, Microscopy, Patent applications, Product development.

A device is described for displaying and recording angled views of a sample to be viewed by a microscope. A multiangled mirror microscope adaptor, a microscope and a camera positioned for viewing and photographically recording the sample are included.

PAT-APPL-385013/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A SPECTROMETER INTEGRATED WITH A FACSIMILE CAMERA.
Patent Application.
E. E. Burcher, D. J. Tobson, S. J. Katzberg, and W. L. Kelly, Iv. Filed 2 Aug 73, 12p NASA-CASE-LAR-11207-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cameras, *Facsimile communication, *Outer planets explorers, *Spectrometers, Imaging techniques, Patent applications, Photometers.

Spectrometer capability is integrated with the basic imagery function of facsimile cameras without significantly increasing mechanical or optical complexity, or interfering with the imaging function. The system consists of a group of photodetectors arranged in a linear array in the focal plane of the facsimile camera with a separate, narrow band interference filter centered over each photodetector. The interference filter photodetector array is on a line in the focal plane of the facsimile camera along the direction of image motion due to the rotation of the facsimile camera's vertical mirror. As the image of the picture element of interest travels down the interference filter photodetector array, the photodetector outputs are synchronously selected and sampled to provide spectral information on the single picture element. The selection of the proper photodetector and data sampling is controlled by information derived from the servo system controlling the vertical mirror rotation.

PATENT-3 673 942/GA Not available NTIS
Department of the Air Force Washington D C
CAMERA SHUTTER.
Patent,
Frederick M. Tingley. Filed 20 Oct 69, patented 4 Jul 72, 5p Rept nos. PAT-APPL-867 620,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Camera shutters, *Patents), High-speed cameras, Remote control systems, Servomotors.
Identifiers: PAT-CL-95-97.

The patent describes a shutter for use with a conventional camera using a rotary stepper servo motor as a drive means. The motor drives a first drum which in turn drives a second drum in order to advance a curtain attached thereto. This curtain has a plurality of slits therein which act as the shutter of the camera as they pass before the optical cone of the camera.

PATENT-3 744 148/GA Not available NTIS
Electronic Image Systems Corp., Cambridge, Mass.
DRYING APPARATUS FOR PHOTOGRAPHIC SHEET MATERIAL.
Patent.
P. Epstein, G. Donovan, and E. Lawhite. Patented 10 Jul 73, 7p NASA-CASE-GSC-11074-1,
Misc-Filed 12 Nov. 1971 Supersedes N72-20391 (10 - 11, p 1472). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Drying, *Photographic processing equipment, Air flow, Patents.

An elongated drying chamber is provided with transport means for carrying photographic sheet material edgewise with the sheets in end-to-end relationship past a plurality of tubes that issue drying air streams. The tubes are slotted a distance equal to substantially the full width of the sheet material for complete, gentle drying by sheets of air. A common plenum supplies the tubes with heated air; the air is directed from the tube slots at a pronounced angle to the sheet surface to provide for arraying the tubes close to the surface for maximum drying effect while minimizing the danger of mechanical interference between the edges of the sheets and the slots in the tubes. The driver for the transport is housed in an enclosure between the plenum and the drying chamber; an air return duct is provided along another side to complete insulation of the drying chamber from ambient conditions.

15. MILITARY SCIENCES

15B. Chemical, Biological, and Radiological Warfare

PATENT-3 705 474/GA Not available NTIS
Office of the Secretary of the Army Washington D C
METHOD TO PREVENT TOXIC GAS EMISSION.
Patent,
Donald E. Smith. Filed 21 Jan 71, patented 12 Dec 72, 4p Rept nos. PAT-APPL-108 541,
Previously filed as PAT-APPL-796 367, 4 Feb 69.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Chemical warfare agents, *Containers), (*Patents, Containers), Warheads, Moisturepoofing, Polyethylene plastics, Linen, Sarin.
Identifiers: PAT-CL-53-22-A, Heat sealing.

The invention relates to a method of containing, shipping, storing, and handling objects to prevent moisture from entering a storage container and to prevent toxic gas emission from the container. The method uses a barrier shipping and storage container for a rocket system warhead section containing conventional GB toxic agent.

15C. Defense

AD-767 349/4GA PC$3.25/MF$1.45
Army War Coll Carlisle Barracks Pa
AN ANALYSIS OF POTENTIAL MANAGERIAL PROBLEMS IN THE HARDSITE DEFENSE PROJECT OFFICE.
Monograph,
John H. Reeve. 17 Feb 72, 25p

Descriptors: (*Antimissile defense systems, *Management engineering), (*Army, Organizations), Reviews, Efficiency.

The Hardsite Defense Project Office was organized to accomplish all necessary effort culminating in a prototype demonstration of the Hardsite Ballistic Missile Defense System. The Office was added to the existing Safeguard System Command. The organization of the office is similar to most governmental units except for a lack of structure below division level to permit flexibility in task assignments. The use of a System Engineering and Technical Assistance Contractor, reporting directly to the Office, to assist in managing the Hardsite Program is unique in Army Project Management. The external relationships of the office with its higher headquarters and other participating organizations present some potential management problems for the Director of the Office. The analysis of potential problems is based on the author's personal participitation in the establishment of the Office and his comparison of the structure and organizational relationships to contemporary management principles being taught in business colleges. (Author)

AD-767 350/2GA PC$3.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE IMPACT OF A MODERN VOLUNTEER ARMY ON ROTC.
Student essay,
John H. Chitty, Jr. 2 Jan 72, 19p

Descriptors: (*Armed forces reserves, *Personnel management), Universities, Recruiting.
Identifiers: ROTC(Reserve Officer Training Corps), Reserve officer training corps.

The basic question is whether or not the Army ROTC program in a zero-draft environment can continue to provide the required numbers of new officer accessions. The decline in enrollments in

ROTC, the continued need for the program, as well as recent actions and proposals to enhance ROTC were examined. Data obtained from a literature search and the author's observations during his assignment as PMS formed the basis for conclusions reached. The decline in enrollments, related directly to the easing of draft pressures, will be offset somewhat by recent legislation to increase pay and raise the number of ROTC scholarships. Yet until the attitude of the general public improves, it is doubtful that ROTC will continue to be the primary source of junior officers in a draft-free environment. (Author)

AD-767 351/0GA PC$3.00/MF$1.45
Army War Coll Carlisle Barracks Pa
CAN THE RESERVE SURVIVE IN THE VOLUNTEER ARMY.
Student essay,
Louis H. Ginn, III. 1 Oct 71, 20p

Descriptors: (*Armed forces reserves, Personnel management), Motivation, Organizations.
Identifiers: All volunteer armed forces.

As the Active Army moves toward a Modern Volunteer Army, there is great concern as to the Reserve Components' ability to maintain their strength without the motivation of the draft on Reserve enlistments. This paper begins by examining the Report of the President's Commission on an All-Volunteer Armed Force, looks into the significant studies made by the Army and various other agencies and persons relating to the Reserve in a zero draft environment, and finally analyzes a Reserve survey concerning Reservists' likes and dislikes about the program. The paper concludes that the Reserve can survive in the All-Volunteer Army with (1) a modest set of monetary incentives, (2) the true adoption of the one army concept, (3) an enlightened reorganization policy, and (4) the improvement of Reserve units through better leadership. The last conclusion is felt to be the most important. (Author)

AD-767 355/1GA PC$3.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE ROLE OF THE RESERVE COMPONENTS IN THE STRUCTURE OF THE MODERN VOLUNTEER ARMY.
Student essay,
Robert P. Snyder. 15 Oct 71, 18p

Descriptors: (*Armed forces reserves, Personnel management), Army personnel, Reviews, Organizations, Deployment.
Identifiers: All volunteer armed forces.

The research examines the role and requirements of the reserve components in support of the modern volunteer army. Recommendations, based on conclusions derived from this examination, are made via a new and unique plan for reorganization of the reserve components to achieve a capability for deployment. (Author)

AD-767 356/9GA PC$3.50/MF$1.45
Army War Coll Carlisle Barracks Pa
MEETING THE FUTURE MANPOWER NEEDS OF THE ARMED FORCES OF THE UNITED STATES.
Student essay,
Daniel C. Pfannstiel. 15 Oct 71, 26p

Descriptors: (*Armed forces reserves, *Personnel management), Recruiting, Army, Manpower.
Identifiers: All volunteer armed forces.

The purpose of the essay was to examine alternative means for meeting the manpower needs of the US Armed Forces in the future with particular focus on the reserve structures of those forces. The Selective Service as currently operated was compared with alternative means which have been advanced for meeting the personnel needs of the Armed Forces. (Modified author abstract)

AD-767 361/9GA PC$5.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE ROLE OF THE ARMY IN AMERICAN SOCIETY IN THE 1970'S.
Monograph,
C. T. Selby. 31 Mar 72, 56p

Descriptors: (*Army, Public opinion), Sociology, Leadership.

The purpose of the paper is to define a role for the Army in American society in the 1970's. The objective is to examine briefly the current societal environment, with emphasis on the national setting, to determine the implications of forces, trends, and issues in that environment upon the Army's function as a societal institution.

ORNL-4818/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
PASSIVE-ACTIVE DEFENSE STUDIES FOR THE DETROIT METROPOLITAN AREA. FINAL REPORT.
C. M. Haaland, and M. T. Heath. Dec 72, 277p
Contract W-7405-eng-26

Descriptors: (*Civil defense, *Shelters), Biological shielding, Comparative evaluations, Cost, Human populations, Injuries, Local fallout, Mortality, Nuclear weapons, Radiation protection, Shock waves, Subsurface structures, Usa.

For abstract, see NSA 28 02, number 04947.

15E. Logistics

AD-767 056/5GA PC$4.50/MF$1.45
Logistics Management Inst Washington D C
DEVELOPMENT OF A MAINTENANCE ACTION SCHEDULING ALGORITHM.
Aug 73, 146p Rept no. LMI-73-15
Contract SD-321

Descriptors: (*Scheduling, Maintenance), (*Naval vessels(Combatant), Maintenance), (*Naval vessels(Support), Maintenance), Manpower, Costs, Computer programs, Control sequences.
Identifiers: *Logistics management, *Maintenance management, FORTRAN.

The report documents a computer-based scheduling algorithm developed for the Shipsystem Maintenance Monitoring and Support Officer of the Naval Ship Engineering Center. While specifically developed for their needs, it is a system of general applicability. It will aid in scheduling an arbitrary number of tasks, with an arbitrary number of alternative means for performing each task, over a large number of periods (120). The tasks may be performed a number of times (up to 10). The same series of tasks is performed over time on a number of entities. The number of resources, or skills, that can be considered is large (45). Tables and graphs that detail the assignment of the various skills over time are produced. The program produces schedules of minimum manpower or minimum cost but manual changes to the scheduled period and to the alternative selected for each task may be made. Management reports are produced to show the costs for a given schedule by various breakouts. Costs fall into up to seven categories and both investment and per-task costs can be considered. Reports on supply costs, by item, can be produced. (Author)

AD-767 090/4GA PC$3.25/MF$1.45
Navy Fleet Material Support Office Mechanicsburg Pa Operations Analysis Dept
ANALYSIS OF CRITERIA FOR CHANGING STANDARD PRICES,
S. D. Neely, and T. E. Searer. 31 Aug 73, 23p Rept no. 73

Descriptors: (*Inventory analysis, *Costs), (*Naval equipment, *Navy budgets), Naval procurement, Logistics, Maintenance, Management control systems, Economics, Impact.
Identifiers: Logistics management, Management analysis, Cost comparison, Benefit cost analysis, Economic analysis, Prices.

Under current procedures, a Navy ICP (Inventory Control Point) notifies its customers of changes in repair part prices whenever the difference between the new standard price and the catalog price has an impact of at least $50 on the value of annual demand. Upon completing an inspection of the Navy Electronics Supply Office, the Naval Supply Systems Command Inspector General recently recommended the policy be changed so that a new price is published whenever the difference between the new and published price is 10% or more. Certain costs are incurred each time a notification of a price change is given. A study was performed to determine the most economical policy for making price changes. The current policy was tested varying the $50 impact value from $.01 to $160. The proposed policy was tested varying the 10% change value from 1/5% to 12%. The results indicated that the current policy requiring a $50 impact on the value of annual demand is the most economical. (Modified author abstract)

AD-767 200/9GA PC$3.00/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
THE COMPOSITION OF REPORTED HOW-MALFUNCTIONED CODES.
Final rept.,
Nilss M. Aume. May 73, 37p Rept no. AMRL-TR-72-89

Descriptors: (*Air force equipment, Malfunctions), (*Reports, Maintenance), Coding, Classification, Statistical data, Optimization.
Identifiers: *How malfunctioned codes, Mnemonic codes, Failure analysis.

A sample of over 61,000 maintenance reports was analyzed with respect to frequency of use of the how-malfunctioned codes. Approximately negative-exponential distributions of reported code frequencies were found, with the single most frequently used code accounting for 28.8% of all reports, the two most frequent codes accounting for 38.4%, and five codes accounting for 50.2%. 50% of the work centers used nine or fewer codes. The results of this study lend support to the desirability of substituting a mnemonic code for the current how-malfunctioned coding system. (Modified author abstract)

AD-767 296/7GA PC$7.25/MF$1.45
Stanford Research Inst Menlo Park Calif
POST-1971 MATERIALS HANDLING SYSTEM: TRAFFIC ANALYSIS.
Final rept. 28 Jun 66-15 Mar 67,
William L. Bryson, Frederick DeB. Witzel, and Thomas H. Tebben. Feb 67, 101p
Contract AF33(657)-6585
Prepared in cooperation with Douglas Aircraft Co., Inc., Long Beach, Calif.

Descriptors: (*Air transportation, Cargo), (*Cargo, *Handling), Cost effectiveness, Air traffic, Transport planes, Pallets, Containers, Command + control systems, Hoists, Air force research, Conveyors, Airports, Logistics, Shipping(Marine), Cargo ships.
Identifiers: Containerizing, *Air cargo handling systems, Unitizing.

The study is a result of the immediate need for a comprehensive technical examination of an effective air cargo handling system in the period from 1971 to 1985 and is specifically focused on an analysis of air cargo traffic.

AD-767 448/4GA PC$11.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va

REAR SERVICES AND SUPPLY OF THE SOVIET ARMED FORCES. NUMBER 3, MARCH 1973.
16 Jul 73, 177p Rept no. FSTC-HT-23-49-74
Trans. of Tyl i Snabzhenie Sovetskikh Vooruzhennykh Sil (USSR) n3 p2-19 Mar 73. The above journal is translated on a regular basis.

Descriptors: (*Armed forces(Foreign), *USSR), (*Logistics, Armed forces(Foreign)), Military training, Transportation, Armed forces supplies.
Identifiers: Translations.

Articles have been translated and taken from the Soviet journal entitled Rear Services and Supply of the Soviet Armed Forces. Articles were written by Soviet military personnel.

AD-767 535/8GA PC$3.50/MF$1.45
Army Natick Labs Mass
EVALUATION OF AN ELECTRIC, RADIANT-HEAT, QUARTZ OVEN.
Technical rept.,
Robert L. Bernazzani, Robert L. Blais, Paul A. Bows, and Keith A. Kornuta. Jan 73, 28p Rept no. USA-NLABS-TR-74-8-GP

Descriptors: (*Cooking devices, Reliability), Efficiency, Heating, Food, Safety, Military rations, Furnaces, Quartz.
Identifiers: Evaluation, *Ovens.

The radiant-heat quartz oven was evaluated to determine its ability to rapidly heat small quantitites of pre-cooked frozen food and its acceptability as a backup oven in the satellite dining facilities of the centralized food preparation system concept. The oven was evaluated from a mechanical, food production, sanitary, and safety viewpoint and found to be satisfactory for heating precooked food items in small quantities. Reheating time was less than half that required in large capacity convection ovens. Product appearance was good; cleaning was easily accomplished; and there were no safety hazards noted. (Author)

PATENT-3 696 474/GA Not available NTIS
Office of the Secretary of the Army Washington D C
LACING LOCK FOR HOOD.
Patent,
John Slauta. Filed 17 Dec 70, patented 10 Oct 72, 6p Rept nos. PAT-APPL-99 171,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Clothing, *Patents), (*Fastenings, Clothing), Army research.
Identifiers: PAT-CL-24-266, *Garment hoods, *Lacing locks.

The invention relates to a lacing lock for the lacing of a garment hood to facilitate adjustment of the size of the hood opening and maintenance of the adjusted size regardless of head movements.

15G. Operations, Strategy, and Tactics

AD-767 070/6GA PC$4.25/MF$1.45
Honeywell Inc Minneapolis Minn Systems and Research Center
LLNO MEDEVAC HUMAN FACTORS ANALYSIS.
Final rept.,
James R. Peterson, and James W. Wingert. 1 Feb 73, 122p Rept no. 12609-FR1 JANAIR-730704
Contract N00014-69-C-0460

Descriptors: (*Airmobile operations, *Human engineering), (*Helicopters, *Close support), Navigational aids, Night flight, Low altitude, Flight control systems, Display systems, Cockpits, Instrumentation.
Identifiers: LLNO(Low Level Night Operations), Low level night operations, MEDEVAC(Medical Evacuation), Medical evacuation, Avionics.

The report presents the results of a study to support the preliminary System Synthesis task of the Low Level Night Operations (LLNO) program, as it applies to LLNO Search and Rescue and LLNO Medical Evacuation Missions. The study consisted of analytic studies of human factors problems. Recommendations are made for displays and controls and for a layout in the helicopter cockpit. (Author)

AD-767 091/2GA PC$5.50/MF$1.45
National Military Command System Support Center Washington D C
MODIFICATIONS TO THE NMCSSC QUICK REACTING GENERAL WAR GAMING SYSTEM (QUICK 1973).
System planning manual,
Michael A. Blackledge, Donald F. Webb, Richard L. Page, and Paul D. Flanagan. 30 Jul 73, 202p
Rept no. NMCSSC-SPM-80-73
See also report dated 2 Apr 73, AD-765 325.

Descriptors: (*War games, *Programming(Computers)), (*Nuclear warfare, Mathematical models), Strategic warfare, Antimissile defense systems, Antiaircraft defense systems, Instruction manuals, Simulation, Corrections.
Identifiers: QUICK(Quick Reacting General War Gaming System), Quick reacting general war gaming system, Computerized simulation, FORTRAN, Allocation models.

The computerized QUICK-Reacting General War Gaming System (QUICK) is a two-sided strategic nuclear exchange war gaming system. It is designed to assist the military planner in examining various facets of strategic nuclear war involving a variety of forces, strategies, and starting conditions. Based on suitable input data, QUICK will automatically generate global strategic nuclear war plans, simulate the planned events, and provide statistical output summaries. The report describes the war gaming capabilities to be added, performance requirements, computer software and hardware required to use the revised QUICK System, appropriate system logic to reflect how the new capabilities will fit into the overall QUICK war gaming system, changes in user input data requirements as a result of the modifications, antitipated program parameter controls, form of output from QUICK before and after the modifications, computer programming algorithms to be added, impact on existing Computer System Manuals, and testing procedures. It will also identify sources for new user input requirements, and identify requirements for government support. The scope of this manual is limited to those modifications planned for integration into the QUICK System from 1 January 1973 to 30 June 1973. (Author)

AD-767 211/6GA PC$2.75/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
A TWO-REFERENCE-POINT PROCEDURE FOR LOCATING A TARGET.
Final rept. Oct 69-Sep 71,
Nilss M. Aume. May 73, 23p Rept no. AMRL-TR-72-90

Descriptors: (*Surface targets, *Position finding), (*Aerial reconnaissance, *Close support), Aviation personnel, Target acquisition, Errors, Visual perception, Triangulation, Flight testing, Analysis of variance.
Identifiers: FAC(Forward Air Controllers), Forward air controllers.

Subjects flying in a light aircraft at 3000-ft altitude estimated the locations of ground targets in relation to two fixed markers. Sighting was done with naked eyes or by use of a special sighting device. The estimates were expressed in polar coordinates: the distance was expressed as a ratio to the inter-marker distance, and the angle in terms of clock hours with respect to a line through the markers. A target precisely in middle between the markers produced no error. Otherwise, errors--the distance between the target and its estimate--increased with greater target-to-center distances. The sighting device failed to produce any improvements, due to the amount of tracking necessary and to turbulence. (Author)

AD-767 262/9GA PC$2.75/MF$1.45
Army Research Inst for the Behavioral and Social Sciences Arlington Va
APPLICATION OF A METHOD FOR DETERMINING INFORMATION REQUIREMENTS IN A FIELD ARMY,
James M. McKendry, Reese C. Wilson, Douglas J. Mace, and James D. Baker. Aug 73, 23p Rept no. ARI-Technical paper-247

Descriptors: (*Command + Control systems, *Data processing systems), (*Combat readiness, Optimization), Tactical warfare, Military intelligence, Chemical warfare, Biological warfare, Radiological warfare, Fire control systems, Decision making, Automation, Effectiveness, Army, Europe.

Within the Army Research Institute, the Command and Control Work Unit Area is concerned with human factors problems of information presentation, processing, and utilization in command and control systems. The Army has under development a number of automatic information systems aimed at expediting tactical staff operations in the field, by providing vital information to staff officers in sufficient detail at appropriate times. The research presented here provided techniques and data for more effectively evaluating one of these systems, the Tactical Operations System (TOS) in the Seventh Army in Europe, and its user information requirements. A survey was devised from analysis of staff journal entries made during field training and command post exericses. The survey listed 61 common information items, with subdivisions indicating level of information detail desired. Subjects checked which items, in how much detail, were most important to them in the field. Responding were 86 experienced staff officers, from four staff elements--G2 (Intelligence), G3 (Operations), FSCE (Fire Support Coordination Element), and CBRE (Chemical, Biological, and Radiological Element)--and from two separate Corps, from Infantry and Armored divisions, and from three echelons of command (Army, Corps, and Division). The officers' subjective judgments were converted to scores which permitted each officer's response to receive equal weight even though the number of information items considered crucial by each officer varied from person to person. (Modified author abstract)

N73-28609/8GA PC$5.75/MF$1.45
Stuttgart Univ. (West Germany). Inst. A fuer Mechanik.
APPLICATION OF THE THEORY OF OPTIMAL CONTROL AND PARAMETER OPTIMIZATION IN OPERATIONS RESEARCH ANWENDUNG DER THEORIE OPTIMALER STEUERUNG UND PARAMETEROPTIMIERUNG IN DER UNTERNEHMENSFORSCHUNG.
G. Heess, and U. Clauss. 1973, 71p BMVG-FBWT-73-9
Subm-Sponsored by Bundesmin. Fuer Verteidigung.
In German; English Summary.

Descriptors: *Antimissile missiles, *Game theory, *Military technology, *Strategy, *Warfare, Armed forces, Difference equations, Differential equations, Optimal control.

For abstract, see STAR 1119

PATENT-3 700 397/GA Not available NTIS
Office of the Secretary of the Army Washington D C.
CAMOUFLAGED ARTICLE AND METHOD OF PRODUCING SAME.
Patent,
Alvin O. Ramsley, and John T. Walwood. Filed 6 May 69, patented 24 Oct 72, 7p Rept nos. PAT-APPL-822 218,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Camouflage, *Patents), (*Textiles, Camouflage), (*Army personnel, Clothing), Dyes, Electromagnetic fields, Spectrum signatures, Visibility, Fluorescence.
Identifiers: PAT-CL-8-4.

The patent concerns a method of camouflaging dyeable materials against daylight or nighttime detection. This involves dyeing the material with a dye composition producing a desired shade in the visible range of the spectrum and fluorescence in the near infrared range from 0.70 to 0.90 micron wavelength, and over-printing the dyed material with lines of a printing compositon containing an energy absorbent pigment, such as carbon.

16. MISSILE TECHNOLOGY

16A. Missile Launching and Ground Support

AD-767 581/2GA PC$8.25/MF$1.45
Mechanics Research Inc Albuquerque N Mex
A GUIDE FOR THE DESIGN OF SHOCK ISOLATION SYSTEMS FOR BALLISTIC MISSILE DEFENSE FACILITIES.
Technical rept. Jul 71-Oct 72,
Robert E. Crawford, Cornelius J. Higgins, and Edward H. Bultmann, Jr. Aug 73, 401p CERL-TR-S-23
Contract DACA23-72-C-0001
Report on Response Analysis for In-Structure Motion in Nuclear Environment.

Descriptors: (*Underground structures, Vibration isolators), (*Antimissile defense systems, *Launching sites), Design, Shock absorbers, Springs, Shock(Mechanics), Vibration, Damping, Seismic waves, Nuclear explosions.
Identifiers: Hardened installations, Ground motion, Overpressure, Design criteria.

The report is primarily intended for designers or analysts with limited backgrounds in structural dynamics or shock isolation principles. It presents simplified procedures for accomplishing feasibility studies or preliminary designs of shock isolation systems for ballistic missile defense systems. The various sections of the guide include methods for predicting inputs to shock isolation systems, basic techniques for analysis of the systems, criteria related to shock sensitivity of personnel and equipment, methods for sizing of various types of isolation devices and guidance regarding the more common arrangements of suspension systems. Although the objective of the guide is the presentation of simplified procedures, much of the information contained herein is equally applicable to a more detailed analysis of shock isolation systems. (Author)

16B. Missile Trajectories

AD-767 280/1GA PC$4.75/MF$1.45
Polytechnic Inst of Brooklyn N Y Dept of Aerospace Engineering and Applied Mechanics
THE INTERACTION OF A HYPERSONIC PLUME WITH AN EXTERNAL HYPERSONIC STREAM.
Research rept.,
John T. Kelly. Jul 73, 164p Rept no. PIBAL-73-12
Contract DAHC04-69-C-0077, ARPA Order-1442

Descriptors: (*Exhaust gases, Interactions), (*Reentry vehicles, Hypersonic flow), Flow fields, Thermodynamics, Shock waves, Aerodynamic heating, Mathematical models, Blunt bodies, Stagnation point.
Identifiers: Gas dynamics, Plumes.

A theoretical study of the gas dynamic interaction between a hypersonic plume and the opposed hypersonic external stream is presented. Steady, axisymmetric, inviscid, perfect gas flow is postulated for both the bow and far field regions. Limiting forms of solutions are obtained for the bow region by application of the Newton-Busemann approximation to both the exhaust plume and ambient air flow. Through asymptotic expansions and their matching, it is found that six regions are required to adequately describe the bow region. For the far field region, the hypersonic small-disturbance form of the Newton-Busemann approximation is applied. From asymptotic expansions and their matching, it is found that entropy wake solutions are required to adequately describe the exhaust flow and the air flow near the contact surface. Analytical solutions are obtained which (1) define scaling parameters for the bow and far field flow; (2) estimate the accuracy of the Newtonian impact theory in predicting bow region geometry and properties; (3) establish the variation of bow and far field properties with variation in the primary system design parameters. (Modified author abstract)

16C. Missile Warheads and Fuses

AD-767 570/5GA PC$18.50/MF$1.45
Mcdonnell Douglas Astronautics Co Huntington Beach Calif
ACTIVE NOSETIP EVALUATION STUDY.
Final rept. 15 May-15 Dec 72.
Nov 72, 330p Rept no. MDC-G4795 SAMSO-TR-73-74
Contract F04701-72-C-0233

Descriptors: (*Guided missile warheads, *Heat shields), Nose cones, Evapotranspiration, Heat flux, Atmosphere entry, Servomechanisms, Aerodynamic heating.
Identifiers: Pointed bodies, Nose tips.

A compact, lightweight expulsion system for a transpiration-cooled nosetip has been designed. This system is sensitive to the environment and is capable of meeting the requirements of a wide variety of maneuvering reentry missions. An additional task was the completion of a nosetip rest on a rocket sled that passed through a rain environment. (Author)

16D. Missiles

AD-767 258/7GA PC$3.50/MF$1.45
Army Missile Command Redstone Arsenal Ala Aeroballistics Directorate
THE EFFECT OF WRAP-AROUND FINS ON AERODYNAMIC STABILITY AND ROLLING MOMENT VARIATIONS.
Technical rept.,
C. W. Dahlke, and J. C. Craft. 20 Jul 73, 55p Rept no. RD-73-17

Descriptors: (*Fins, Stability), (*Guided missiles, Aerodynamic control surfaces), Configuration, Angle of attack, Roll, Transonic characteristics, Drag, Wind tunnel models.
Identifiers: Wrap around fins.

The report presents the results of an investigation of the effect of wrap-around fins on missile rolling moment coefficient. This investigation was conducted for four fin configurations at free stream Mach numbers ranging from 0.3 to 2.86. The wrap-around fin was found to have a self induced roll moment at zero angle of attack that varies with Mach number. This effect was studied for several fin geometric configurations for the static moment case. Comparisons between the moments caused by the fin cant and wrap-around fins are shown for the rolling case. (Author)

AD-767 277/7GA PC$7.75/MF$1.45
Auburn Univ Ala Engineering Experiment Station
DESIGN OF ADVANCED SAMPLED DATA CONTROL SYSTEMS.
Final technical rept. 18 May 72-17 Jul 73,
Charles L. Phillips, and Sherman M. Seltzer. 17 Jul 73, 112p
Contract DAAH01-72-C-0901

Descriptors: (*Guided missiles(Surface-to-surface), Adaptive control systems), (*Adaptive control systems, Mathematical models), Analog-to-digital converters, Digital computers, Transfer functions, Sampling, Graphics, Curve fitting, Guided missile computers.
Identifiers: Numerical integration, *Digital filters, *Pershing, *Control theory, Sampled data systems, XMGM-31A missiles.

The report contains the results of research into techniques for converting analog controllers (filters) to digital controllers, such that the characteristics of the control system remain essentially the same. A major consideration was to employ as low a sampling rate as possible in the digital controller. The control system considered throughout the report was the Pershing Weapons Systems roll-axis control system. First a technique developed by B. C. Kuo was considered. This technique yields excellent results at high sampling rates, with the results not as good as the sampling rate is decreased. Next various numerical integration techniques were investigated. Only the trapezoidal rule yielded good results at low sampling rates. Finally, various techniques developed for the design of digital filters were considered, with only the bilinear transform giving good results at low sampling rates. However, the bilinear transform is equivalent to the trapezoidal rule of numerical integration. (Author)

AD-767 282/7GA PC$35.50/MF$1.45
Calspan Corp Buffalo N Y
TRANSONIC WIND TUNNEL TESTS ON A MISSILE MODEL WITH CANARD WINGS. VOLUME I,
R. E. de Kuyper. Jul 73, 670p Rept no. CALSPAN-AA-4017-W-9-Vol-1
Contract DAAH03-73-C-0243
See also Volume 2, AD-766 660 and Volume 3, AD-766 661.

Descriptors: (*Guided missiles, Transonic characteristics), Canard configuration, Wind tunnel models, Afterbodies, Pitch(Motion), Roll, Yaw, Statistical data, Tables.

Transonic wind tunnel tests were performed in an Calspan Corporation (formerly Cornell Aeronautical Laboratory) Eight-Foot Transonic Wind Tunnel on a missile model with canard wings. The tests were conducted during the end of April and the beginning of May, 1973. Two distinctly different investigations were made. The effect of canard wing positions, canard - tail angular orientation, canard size, model roll angle, and nose shape, were investigated during the Aerodynamic Test Phase. The use of canard wings for roll attitude control was also investigated during this phase. The effect of different jet plumes on the aerodynamic model loads were studied during the Thrust Effect Phase. A normal jet plume simulator was used and the effects of model tail position, planform, and orientation were investigated. The report presents details of the test program and the results in tabular form.

AD-767 533/3GA PC$3.50/MF$1.45
Army Missile Command Redstone Arsenal Ala Guidance and Control Directorate

THE DESIGN, FABRICATION, AND EVALUATION OF A RING WING CANARD CONTROL SYSTEM FOR A SHORT RANGE MISSILE.
Technical rept.,
Joe S. Hunter. 1 Aug 73, 72p Rept no. RG-73-16

Descriptors: (*Ring wings, Design), (*Guided missiles, Control systems), Canard configuration, Wing tunnel models, Angle of attack, Pitch(Motion), Yaw, Roll, Flow visualization.

The report covers the ring wing canard control system from its initial design phase through a series of wind tunnel tests and into the present design improvement phase. The initial design used a low drift air bearing developed on an in-house gyro program. The gyro rotor was modified to interface with a ring wing air foil. Wind tunnel tests were conducted to determine the flow characteristics, center of pressure, nutation rate, precession rate, normal force coefficient, and pitching moment coefficient of the ring wing. The ring wing canard gyro control concept mechanizes a sensor controller to guide a missile without any requirements for inflight power, preflight power, electronics, or preconditioning. The design is of fire-and-forget technology as its control is completely self-contained. The simplicity of this design gives guided missile performance at slightly over free rocket cost. (Author)

AD-767 652/1GA PC$7.75/MF$1.45
Naval Postgraduate School Monterey Calif
ADAPTATION OF SYSTEM X COMPUTER-ASSISTED PROJECT MANAGEMENT EXERCISES FOR USE AT THE NAVAL POSTGRADUATE SCHOOL.
Master's thesis,
Herbert Henry Joseph Nicholson. Jun 73, 114p

Descriptors: (*Guided missiles(Surface-to-surface), Systems engineering), Decision making, Management planning, Contracts, Armed forces procurement, Logistics, Production control, Computer programs, Theses.
Identifiers: Computerized simulation, Management information systems, Logistics management.

System X is a series of project management oriented case studies supported by an interactive time-sharing computer program simulating the analysis and evaluation of a hypothetical surface-to-surface guided missile system acquisition program. The computer-assisted exercises operate from baseline data supplied by a data base, along with system parameters set by the user, in order to compute various deterministic statistics regarding system performance and system costs. The system parameter values may be readily changed and the computations repeated. A desired result may be obtained by repeated iterations of the process. (Author)

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-767 119/1GA Reprint
Woods Hole Oceanographic Institution Mass
CW BEACON SYSTEM FOR HYDROPHONE MOTION DETERMINATION.
Technical rept.,
R. P. Porter, R. C. Spindel, and R. J. Jaffee. 18 Dec 72, 13p Rept nos. WHOI-73-53, WHOI-Contrib-2995
Contract N00014-70-C-0205
Availability: Pub. in the Jnl. of the Acoustical Society of America, v53 n6 p1691-1699 1973.

Descriptors: (*Hydrophones, Underwater tracking), Doppler systems, Phase measurement, Real time.
Identifiers: Sonobuoys.

A system consisting of three bottom-moored 12 000-Hz CW beacons, each separated in frequency by 40 Hz, and separated in space by about 8 km, has been used to track the motion of ship-suspended, ship-mounted, sonobuoy-deployed, and bottom-moored hydrophones to an accuracy of 4 cm. The system uses Doppler tracking of the beacon signals to provide real-time estimation of hydrophone velocity and displacement. Factors that might compromise system performance, such as surface, bottom or forward volume scattering, or multipath effects, were found to be negligible. Random phase fluctuations in beacon signals due to these phenomena are small compared with those due to hydrophone motion. Two tests of the system, near Eleuthera Island and near Bermuda, were made in September-October 1972. (Author)

AD-767 368/4GA PC$3.00/MF$1.45
Texas Univ Austin Applied Research Labs
MODEL STUDIES OF FLUCTUATIONS OF INTERFERING DIRECT AND SURFACE REFLECTED PULSES.
Final rept. 1 Feb 72-30 Jun 73,
Aubrey L. Anderson, Karl C. Focke, and Donald J. Shirley. 31 Jul 73, 49p Rept no. ARL-TR-73-38
Contract N00014-70-A-0166-0009

Descriptors: (*Underwater sound signals, Scattering), (*Sonar targets, Target recognition), Ocean waves, Surface roughness, Reflection, Statistical functions, Power spectra, Signal-to-noise ratio, Model tests.
Identifiers: Lake Travis.

Scaled measurements of the fluctuating acoustical signal resulting from interference of the direct and surface reflected signals from complex targets are reported. Water surface and acoustic autocorrelation functions and spectra are examined for both stationary targets and targets with yaw motion. The scaled surface waves are compared to ocean waves. (Author)

PATENT-3 698 240/GA Not available NTIS
Office of the Secretary of the Army Washington D C
ELECTRONIC CIRCUIT FOR PREVENTION OF RECEIVER PARALYSIS IN ULTRASONIC ECHO RANGING.
Patent,
Otto R. Gericke. Filed 29 Sep 71, patented 17 Oct 72, 7p Rept nos. PAT-APPL-184 741,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Suppressors, *Patents), Echo ranging, Amplifiers, Broadband, Pulse generators, Ultrasonic radiation, Test equipment.
Identifiers: PAT-CL-73-67-9.

The patent relates to ultrasonic pulse-echo tests instruments and more particularly for the purpose of reducing the amplitude of initially transmitted pulses at the input of a high gain wide-band amplifier normally used in such instruments.

PATENT-3 721 949/GA Not available NTIS
Department of the Navy Washington D C
ECHO REPEATER TARGET.
Patent,
William C. Hubbard, Keith E. Geren, and Warren A. Sauer. Filed 30 Sep 64, patented 20 Mar 73, 4p Rept nos. PAT-APPL-400 608,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Sonar equipment, *Patents), (*Coupling circuits, Sonar equipment), Transducers, Tuned circuits, Power amplifiers.
Identifiers: PAT-CL-340-3-E.

The invention relates to broadband low frequency amplifiers and is particularly directed to amplifiers of the type useable in high-powered sonar repeaters. The object of this invention is to provide an improved transducer driving circuit. A more specific object of the invention is to provide improved coupling circuits between a power amplifier and a transducer for maintaining a high power factor over a wide band of frequencies.

17B. Communication

AD-767 218/1GA PC$4.50/MF$1.45
Computer Sciences Corp Falls Church Va
TIME DIVISION MULTIPLE ACCESS (TDMA) NETWORK CONTROL STUDY.
Final rept. Oct 72-Jun 73,
Gabriel Frenkel, George V. Kinal, Diwakar G. Gan, and John E. Doggett. Aug 73, 149p* RADC-TR-73-270
Contract F30602-73-C-0057

Descriptors: (*Radio relay systems, Communication satellites(Active)), (*Multiplex, Control systems), Programming(Computers), Pulse modulation.
Identifiers: *Time division multiple access.

The report presents the results of an effort devoted to the development of network control techniques for a Time Division Multiple Access (TDMA) Tactical Satellite Communications System. The study is subdivided into two major phases. Phase I is devoted to the development of the network control system and the associated computer program required for its implementation. Phase II studies the extension of the approach to network control techniques unrestricted by the capabilities of the existing modem and computer. In Phase II, after defining basic satellite, earth terminal and network parameters, the TDMA frame formats and enhanced control techniques are described. Additional topics covered are improvements in modem and satellite design, computer selection and extended software features. (Modified author abstract)

AD-767 224/9GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
ND:YAG 1.06 MICRON LASER COMMUNICATION SYSTEM.
Research and development technical rept.,
Martin I. Wolfe. Sep 73, 31p Rept no. ECOM-4148

Descriptors: (*Infrared communication systems, Design), Lasers, Irasers, Safety, Signal-to-noise ratio, Optical filters, Photomultipliers, Quantum statistics.
Identifiers: Neodymium lasers, YAG lasers, Mode locked lasers, Laser safety, Atmospheric attenuation.

A pulse gated binary modulation communication system is analyzed. A detailed analysis of the detection statistics culminating in the calculation of the probability of error for various meteorological conditions and transmission ranges is provided. The analysis is based upon a system designed to transmit 200 megabits of information over a 5 kilometer range in severe haze with the realization of a 10 to the minus 6th power bit error rate. (Author)

AD-767 369/2GA PC$4.00/MF$1.45
Office of Naval Research London (England)
CONFERENCE ON SATELLITE SYSTEMS FOR MOBILE COMMUNICATIONS AND SURVEILLANCE, 13-15 MARCH 1973, LONDON.
Conference rept.,
I. G. Kinnie, and A. H. Waynick. 20 Jul 73, 37p
Rept no. ONRL-C-14-73

Descriptors: (*Radio relay systems, Communication satellites(Active)), (*Air traffic control systems, Radio relay systems), Symposia, Aircraft, Ships, Transponders, Aircraft antennas, Great Britain.

A fairly detailed report is presented on an international conference on the use of satellite systems for intercontinental mobile communications and surveillance. These have been termed an Aerosat system for commercial aircraft and a Marsat system for ships. Some details on the operation of the Skynet military satellite communications system are also reported upon. (Author)

AD-767 392/4GA PC$3.00/MF$1.45
Sperry Rand Corp St Paul Minn UNIVAC Defense Systems Div
PROSODIC AIDS TO SPEECH RECOGNITION. III. RELATIONSHIPS BETWEEN STRESS AND PHONEMIC RECOGNITION RESULTS.
Semiannual technical rept. 1 Mar-31 Aug 73,
Wayne A. Lea, Mark F. Medress, and Toby E. Skinner. 21 Sep 73, 43p Rept no. PX-10430
Contract DAHC15-73-C-0310, ARPA Order-2010
See also AD-759 850.

Descriptors: (*Speech recognition, Phonetics), Acoustic properties, Frequency, Programming(Computers), English language.
Identifiers: Prosodic analysis.

A strategy is being implemented for acoustic aspects of speech recognition, whereby prosodic features are used to detect boundaries between phrases, then stressed syllables are located within each phrase, and a partial distinctive features analysis is done within stressed syllables. Several algorithms are being investigated for locating stressed syllables in continuous speech. Preliminary experiments have shown some success in locating sibilants and determining their places of articulation. Partial distinctive features analysis on stressed vowels has been attempted. Location of stop consonants and sibilants, and sibilant place of articulation determination have been more successful in stressed syllables. Studies are being conducted on the relative success of vowel and obstruent categorizations in stressed, unstressed, and reduced syllables. These studies in segmental analysis, and companion studies in stress perception and automatic location of stressed syllables, are being conducted on 31 ARPA Sentences, but later work will be based on new speech texts now being designed. (Modified author abstract)

AD-767 397/3GA PC$3.00/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
MECHANICAL INFERENCE PROBLEMS IN CONTINUOUS SPEECH UNDERSTANDING,
W. A. Woods, and J. Makhoul. Aug 73, 37p Rept nos. BBN-2565, AI-5
Contract DAHC15-71-C-0088
Presented at the 1973 International Joint Conference on Artificial Intelligence.

Descriptors: (*Speech recognition, Scientific research), Phonetics, Identification, Semantics.

The report describes the types of probabilistic, plausible inferences that a continuous speech understanding system will have to be capable of making in order to extract meaning out of the speech signals that human beings produce. (Author)

AD-767 544/8GA PC$4.50/MF$1.45
Office of Telecommunications Boulder Colo Inst for Telecommunication Sciences
OPTICAL FIBER LINKS FOR TELECOMMUNICATIONS. PART TWO.
Technical rept.,
Robert L. Gallawa, A. G. Hanson, R. B. Chadwick, and M. Kayama. Jul 73, 147p* SCC-ACO-1-73
See also report dated Dec 72, AD-754 566.

Descriptors: (*Light communication systems, Fiber optics), (*Fiber optics, Optical properties), Coherent radiation, Light transmission, Optical glass, Lasers, Photodiodes, Waveguides, Modulators, Optical filters, Infrared communication systems, Military requirements.
Identifiers: Light emitting diodes, Injection lasers, Photodetectors, Optical waveguides, Optical modulators.

The report is addressed to the application of glass fiber optical waveguides to military communication systems. The technical depth of the report is not substantial and hence it can serve as an introduction to the subject. The report contains a review of military requirements, a review of the state of the technology, and a list of recommendations for further work. The latter is broken into two time frames, indicating certain tasks which have a bearing on the mid-1980's time frame. The report contains the justification for the recommendations, which suggest work that could provide the interface between the state of the technology and a workable communication system. (Author)

AD-767 545/7GA PC$3.50/MF$1.45
Office of Telecommunications Boulder Colo Inst for Telecommunication Sciences
MICROWAVE COMMUNICATION LINKS AT 15GHZ.
Technical rept.,
A. P. Barsis, C. A. Samson, and H. T. Dougherty. Jul 73, 65p Rept no. OTM-73-142 SCC-ACO-2-73

Descriptors: (*Microwave communication systems, Attenuation), Superhigh frequency, Rain, Data transmission systems, Adaptive communication systems, Frequency modulation, Broadband, Feasibility studies.
Identifiers: Atmospheric attenuation.

The report examines the feasibility of using frequencies around 15 GHz for point-to-point wideband communication links. First, system parameters are summarized and initial estimates of long-term median performance are presented. This is followed by a discussion of precipitation and other atmospheric effects on line-of-sight propagation at 15GHz. Next, the effects of rainfall and of the statistics of rain rate distributions are applied to system performance estimates, and potential system reliability and outage time are determined. The report includes also a discussion of available equipment components, and a brief analysis of the use of the 15 GHz band for transhorizon links. An alternative method for determining rainfall probabilities is given in the appendix. (Author)

AD-767 546/5GA PC$2.75/MF$1.45
Office of Telecommunications Boulder Colo Inst for Telecommunication Sciences
ON OPTICAL ALTERNATIVES TO MICROWAVE LOS COMMUNICATION SYSTEMS.
Technical rept.,
Harold T. Dougherty. Jul 73, 24p* SCC-ACO-3-73

Descriptors: (*Light communication systems, Lasers), Feasibility studies, Infrared communication systems, Attenuation, Light transmission, Microwave communication systems, Reliability.
Identifiers: Line of sight transmission.

The feasibility of using systems operating in the infra-red and visible portions of the spectrum is examined as an alternative to wide-band microwave systems operating below 10 GHz. The atmospheric limitations for optical systems are described briefly as are the factors determining system reliability. It is concluded that, for the present, systems operating at optical frequencies are a less desirable alternative than those operating at 10 to 20 GHz, for wide-band long-haul communications. (Author)

AD-767 568/9GA PC$8.00/MF$1.45
Telcom Inc Mclean Va
PROGRAMMABLE FRONT-END PROCESSORS APPLIED TO DIGITAL DATA COMMUNICATIONS SYSTEMS.
Final technical rept.,
Philip C. Wood, and Charles Riviere. Jul 73, 119p
RADC-TR-73-183
Contract F30602-72-C-0419

Descriptors: (*Data transmission systems, *Data processing systems), Design, Information theory, Systems engineering, Cost effectiveness, Simulation, Pulse communication systems, Digital systems.
Identifiers: IBM 360/50 computers, IBM 360/65 computers, Telecommunication, Digital communication systems, Pulse communication.

The report covers investigation of typical data communications loadings and facility utilizations developed in systems employing the IBM-360/50 class of computers with hardwired communications controllers and programmable front-end processors. Simulation techniques were used to model applicable configurations and traffic distributions. Comparisons of IBM-360/50 with hardwired communications controllers, upgraded configurations of IBM-360/65 with hardwired communications controllers as well as IBM-360/50 with programmable front-end processors are made. The latter is shown to be the most cost-effective approach for data communications systems. (Author)

COM-73-11454/8GA PC$2.75/MF$1.45
Denver Research Inst., Colo.
TECHNOLOGICAL INNOVATIONS IN VIDEO AND THEIR POTENTIAL MARKET, INSTITUTIONAL AND CONSUMER IMPACTS; EXECUTIVE SUMMARY,
Paul I. Bortz, Eric F. Jaeckel, and Fred P. Venditti. Feb 73, 24p*
Contract Com-OT-0046
See also COM-73-11455.

Descriptors: (*Television systems, *Marketing), Market research, Television equipment, Closed circuit television, Television transmission, Television receivers, Recording instruments, Facsimile transmission.

Potential technological innovations in video that might be introduced within the next ten to twenty years are discussed. Approximately one hundred technical items, grouped into thirty-six categories of innovation, and reviewed briefly in terms of stage of development, estimated time of introduction and potential market impact. Technical feasibility, market size and description, and institutional and consumer impacts are treated in more detail for five selected areas of innovation. The selected areas are video recordings, home terminals, high selectivity television, still picture transmission, and high resolution television.

COM-73-11455/5GA PC$4.50/MF$1.45
Denver Research Inst., Colo.
TECHNOLOGICAL INNOVATIONS IN VIDEO AND THEIR POTENTIAL MARKET, INSTITUTIONAL AND CONSUMER IMPACTS. FINAL REPORT,
Paul I. Bortz, Eric F. Jaeckel, and Fred P. Venditti. Feb 73, 140p*
Contract Com-OT-0046
See also COM-73-11454.

Descriptors: (*Television systems, *Marketing), Market research, Television equipment, Closed circuit television, Television transmission, Television receivers, Recording instruments, Facsimile transmission.

Contents:
Video technology and market review;
Review of selected innovations (Video recording and playback, Home terminals, High selectivity television, Still picture transmission, High resolution television);
Some institutional, regulatory and social factors applying to all five innovations.

COM-73-11492/8GA PC$3.50/MF$1.45
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.

AN OBJECTIVE SPEECH QUALITY MEASUREMENT OF A COMMUNICATION CHANNEL,
J. A. Payne, and P. M. McManamon. Jun 73, 60p* OTR-73-14

Descriptors: (*Telephone systems, Intelligibility), (*Speech recognition, Voice communication), Speech, Accuracy, Measurement.
Identifiers: Articulation index, Speech quality.

A signal generator was constructed for the purpose of objectively testing a communication channel for speech quality. The test signal from the generator is received and processed at the receiver end of the connection. The processed value is an Articulation Index. This value may be obtained in seconds, depending on the type of computer system processor. The primary virtue of this testing method is the low cost in comparison to subjective methods. From the technical literature of the Bell System Technical Journal and the American National Standard S3.5 (1969), theoretical articulation index (AI) values are calculated. Finally, a statistical characterization of transmission loss and message circuit noise for the telephone system is related to theoretical AI value. (Author)

N73-27109/0GA PC$4.25/MF$1.45
ESL, Inc., Sunnyvale, Calif. Electromagnetic Systems Labs.
A ROUGH EARTH SCATTERING MODEL FOR MULTIPATH PREDICTION.
Progress Report.
L. J. Page, and P. C. Chestnut. 24 Jun 70, 42p NASA-CR-132791, ESL-PR53
Contract NAS5-20125

Descriptors: *Earth surface, *Electromagnetic scattering, *Multipath transmission, *Space communication, Performance prediction, Radio communication, Surface roughness effects.

For abstract, see STAR 1118

N73-28018/2GA PC$3.75/MF$1.45
Signals Research and Development Establishment, Christchurch (England).
THE MI PROBLEM OF CO-SITED RADIO SETS WITH REFERENCE TO THEIR PERFORMANCE AS A FUNCTION OF TOTAL LINK SELECTIVITY.
M. J. Walker. Jul 72, 31p SRDE-72023, BR31146

Descriptors: *Communication equipment, *Radio frequency interference, *Radio receivers, *Radio transmitters, Equipment specifications, Product development, Systems analysis.

For abstract, see STAR 1119

N73-28023/2GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TRANSMITTER AND RECEIVER ANTENNA GAIN ANALYSIS FOR LASER RADAR AND COMMUNICATION SYSTEMS.
B. J. Klein, and J. J. Degnan. Jun 73, 67p NASA-TM-X-70423, X-524-73-185
Subm-Submitted for Publication.

Descriptors: *Amplification, *Antenna design, *Optical communication, *Optical radar, Antenna radiation patterns, Receivers, Transmitters.

For abstract, see STAR 1119

PAT-APPL-370271/GA PC$3.00/MF$1.45
Bell Aerospace Co., Buffalo, N.Y.
MODULATOR FOR TONE AND BINARY SIGNALS.
Patent Application.
J. R. Mcchesney, T. Lerner, and E. J. Fitch. 15 Jun 73, 18p NASA-CASE-GSC-11743-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Binary data, *Carrier waves, *Phase modulation, *Signal transmission, *Telecommunication, Digital data, Phase locked systems, Pitch.

Tones and binary information are transmitted as phase variations on a carrier wave of constant amplitude and frequency. The carrier and tones are applied to a balanced modulator for deriving an output signal including only a pair of sidebands relative to the carrier, which has a predetermined phase. The carrier is phase modulated by a digital signal so that it is + or - 90 deg out of phase with the predetermined phase of the carrier. The carrier, in unmodulated form at the predetermined phase, is combined in an algebraic summing device with the phase modulated signal and the balanced modulator output signal. The output of the algebraic summing device is hard limited to derive the constant amplitude and frequency signal. At a receiver, the tones and binary data are detected with a phase locked loop having a voltage controlled oscillator driving a pair of orthogonal detection channels.

PAT-APPL-374422/GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SYSTEM FOR INTERFERENCE SIGNAL NULLING BY POLARIZATION ADJUSTMENT.
Patent Application.
J. E. Ohlson, and W. F. Williams. Filed 28 Jun 73, 18p NASA-CASE-NPO-13140-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Polarization (Waves), *Radio frequency interference, *Signal stabilization, Automatic control, Multichannel communication, Patent applications, Signal to noise ratios.

A receiving system for automatically selecting a desired one of two approximately orthogonally polarized signals occupying the same bandwidth, is disclosed. Received signals are provided by any orthomode antenna system at a pair of output ports, i.e., right hand and left hand circular polarizations or two linear polarizations. The received signals are then applied to the inputs of a hybrid junction to produce sum and difference signals. The resulting sum signal at one output port comprises components of the undesired one of two orthogonally polarized signals and is used to coherently detect and dynamically balance out the undesired signal components that are included at the difference signal port. The desired one of two orthogonally polarized signals is thereby provided at the difference port of the hybrid junction. Feedback loops are used to effect dynamic balancing.

PATENT-3 678 387/GA Not available NTIS
Department of the Air Force Washington D C
SATELLITE COMMUNICATIONS SYSTEM.
Patent,
Quintus C. Wilson. Filed 5 Aug 70, patented 18 Jul 72, 5p Rept nos. PAT-APPL-69 520,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Radio relay systems, *Patents), (*Radio transmission, Space-to-surface), Phase-locked communication systems, Phased arrays, Radio repeaters, Radio equipment, Space communication systems.
Identifiers: PAT-CL-325-4.

The patent describes a ground-air communications system that includes ground station processors, aircraft, and satellite borne repeaters. Satellite weight and power economies are achieved by scanning with repeater antennas. The preferred embodiment uses a phased array antenna having its antenna elements and amplifiers disposed in the satellite borne repeater and its phase shifting and modulating components disposed in the ground station processor. Phase shifted modulated carrier waves are translated in frequency prior to transmission from the ground station processor and are retranslated to their original frequencies by the repeater. Means are provided to lock transmitted and received carrier waves in phase and frequency.

PATENT-3 705 523/GA Not available NTIS
Office of the Secretary of the Army Washington D C
HYBRID ROUTING TECHNIQUE FOR SWITCHING COMMUNICATION NETWORK.
Patent,
Frank B. Alouisa. Filed 21 Sep 70, patented 12 Dec 72, 20p Rept nos. PAT-APPL-73 919,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Switching circuits, *Patents), (*Communication systems, Switching circuits), Electrical networks.
Identifiers: Routing, PAT-CL-179-18-EA.

The patent describes a hybrid routing technique for an analog or digital switching communication network containing several switching centers for contacting a called subscriber at a destination switching center whose location in the network need not be known to the calling subscriber. A deterministic route is provided back from the destination switching center to the originating switching center.

PATENT-3 740 671/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
FILTER FOR THIRD ORDER PHASE LOCKED LOOPS.
Patent.
R. B. Crow, and R. C. Tausworthe. Patented 19 Jun 73, 13p NASA-CASE-NPO-11941-1,
Misc-Filed 6 Apr. 1972 Supersedes N72-27249 (10 - 18, p 2404). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electric filters, *Loops, *Phase locked systems, *Signal reception, Doppler effect, Patents, Signal to noise ratios, Signal transmission.

Filters for third-order phase-locked loops are used in receivers to acquire and track carrier signals, particularly signals subject to high doppler-rate changes in frequency. A loop filter with an open-loop transfer function and set of loop constants, setting the damping factor equal to unity are provided.

PB-223 573/7GA PC$4.25/MF$1.45
Office of Telecommunications Policy, Washington, D.C.
AN INVESTIGATION OF CROSS SUBSIDY, INDUSTRY STRUCTURE, AND PRICING, WITH APPLICATIONS TO DATA UNDER VOICE.
Staff research paper,
Ronald R. Braeutigam. Jul 73, 105p* OTP-SP-14

Descriptors: (*Telecommunication, Economic factors), Industries, Cost analysis, Prices, Grants, Policies, Pulse communication, Data links, Digital techniques, Modulation.
Identifiers: DUV(Data Under Voice), Data under voice.

The paper deals with the following closely related issues in the context of the telecommunications industry: pricing, industry structure, and service cross-subsidy. Where a multi-product firm, some of whose products are monopolistic, participants

in competitive markets, the presenc of cross-subsidized pricing may have a significant impact on the structure of the industry and its performance in terms of how efficiently resources are allocated, how progressive it is, how income is distributed, etc. The paper draws on the case of Data Under Voice technology to elucidate various definitions and tests of cross-subsidy: Incremental Cost Test, Burden Test, Marginal Cost Test, Stand Alone Test, and Consumer Surplus Maximization. Finally, the paper evaluates various industry structures in terms of the maximum level of consumer surplus achievable under each, indicating prices which are economically efficient in each case.

UCID-16216/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
STREAK CAMERA TUBE FOR THE PERIOD OF MARCH 1, 1972--JULY 31, 1972.
R. Kalibjian. 8 Aug 72, 16p

Descriptors: (*Camera tubes, *Design).

For abstract, see NSA 28 03, number 07803.

17C. Direction Finding

AD-767 291/8GA PC$12.25/MF$1.45
Naval Postgraduate School Monterey Calif
APPLYING THE KALMAN FILTER TO THE EMITTER LOCATION PROBLEM USING AIRBORNE ANGLE-OF-ARRIVAL INFORMATION.
Master's thesis,
Edward Harlin Mills. Mar 73, 201p

Descriptors: (*Position finding, Statistical analysis), Direction finding, Computer programs, Information theory, Angle of arrival, Airborne, Theses.
Identifiers: Kalman filters.

A scheme to locate emitter positions using post flight processing of discrete airborne emitter bearing angles-of-arrival information and recorded aircraft position coordinates by Kalman filter techniques is developed. The signal intercept system was assumed to be operating in a multi-emitter environment and all data was sampled at discrete but time varying intervals. The aircraft position data is filtered directly in latitude and longitude and emitter locations are computed in latitude and longitude using vector methods. An extended Kalman filtering scheme is developed to compute emitter coordinates directly in latitude and longitude coordinates. (Author)

AD-853 054/5GA PC$4.75/MF$1.45
Southwest Research Inst., San Antonio, Tex.
LF TO VHF SHIPBOARD DIRECTION FINDING RESEARCH.
Interim development rept. 1 Jan-31 Mar 69,
T. C. Green, and W. M. Sherrill. 31 Mar 69, 54p
Contract N00024-69-C-1205
Distribution Limitation now Removed.

Descriptors: (*Direction finding, Shipborne), Loop antennas, Radio interferometers, Ferrites, Azimuth, Corrections, Calibration, Antenna radiation patterns, Sensitivity.

It is the purpose of the contract to design, develop, and evaluate prototype DF antennas, special DF techniques, and DF calibration circuits which provide practicle state-of-the-art solutions to the shipboard direction finding requirements in the HF and low VHF range. Prototype DF systems and calibration techniques are to be evaluated in a realistic reradiation environment at the SWRI ship simulation site. Experimental results will be combined with fundamental theoretical analysis to provide detailed recommendations as to the optimum DF system for specific navy DF requirements. (Author)

AD-857 289/3GA PC$4.25/MF$1.45
Southwest Research Inst., San Antonio, Tex.
LF TO VHF SHIPBOARD DIRECTION FINDING RESEARCH.
Interim development rept. 1 Apr-30 Jun 69,
T. C. Green, and W. M. Sherrill. 30 Jun 69, 42p
Contract N00024-69-C-1205
See also AD-853 054 and AD-861 196. Distribution Limitation now Removed.

Descriptors: (*Direction finding, Shipborne), Loop antennas, Ferrites, Antenna radiation patterns, Radio interferometers, Calibration, Azimuth, Corrections.

It is the purpose of the contract to design, develop, and evaluate prototype DF antennas, special DF techniques, and DF calibration circuits which provide practical state-of-the-art solutions to the shipboard direction-finding requirements in the HF and low VHF range. Prototype DF systems and calibration techniques are to be evaluated in a realistic reradiation environment at the SWRI ship simulation site. Experimental results will be combined with fundamental theoretical analysis to provide detailed recommendations as to the optimum DF system for specific navy DF requirements. (Author)

AD-861 196/4GA PC$4.25/MF$1.45
Southwest Research Inst., San Antonio, Tex.
LF TO VHF SHIPBOARD DIRECTION FINDING RESEARCH.
Interim development rept. 1 Jul-30 Sep 69,
T. C. Green, R. Lorenz, and W. M. Sherrill. 30 Sep 69, 42p
Contract N00024-69-C-1205
See also AD-857 289. Distribution Limitation now Removed.

Descriptors: (*Direction finding, Shipborne), Loop antennas, Ferrites, Radio interferometers, Azimuth, Corrections, Calibration.

The purpose of the work was to design, develop, and evaluate prototype DF antennas, special DF techniques, and DF calibration circuits which provide practical state-of-the-art solutions to the shipboard direction-finding requirements in the HF and low VHF range. Prototype DF systems and calibration techniques are to be evaluated in a realistic reradiation environment at the SWRI ship simulation site. Experimental results will be combined with fundamental theoretical analysis to provide detailed recommendations as to the optimum DF system for specific navy DF requirements. (Author)

17E. Infrared and Ultraviolet Detection

PATENT-3 723 739/GA Not available NTIS
Department of the Navy Washington D C
WATER-COOLED CHOLESTERIC LIQUID CRYSTAL INFRARED IMAGING DEVICE.
Patent,
Richard F. Horton. Filed 11 Jun 71, patented 27 Mar 73, 9p Rept nos. PAT-APPL-152 306,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Infrared detectors, *Patents), (*Coherent radiation, Infrared detectors), Gas lasers, Irasers, Scintillation.
Identifiers: PAT-CL-250-83-3-H, Carbon dioxide lasers, Laser beams, Laser safety, Liquid crystals.

The patent describes an infrared imaging device for the detection and measurement of hazardous irradiances in a laser beam caused by atmospheric scintillation. The 10.6 micrometer field is displayed visibly through the use of cholesteric liquid crystals on a water-cooled mylar film.

17G. Navigation and Guidance

AD-767 075/5GA PC$3.00/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
THE 1972 LOS ANGELES BASIN STANDARD AIR TRAFFIC MODEL.
Final rept.,
Francis M. Willett, Jr. Sep 73, 49p Rept no. FAA-NA-73-90 FAA-RD-73-90
Contract DOT-HS-013-601-010
See also report dated Apr 73, AD-766 324.

Descriptors: (*Air traffic, Mathematical models), (*California, Air traffic), Air traffic control systems, Reviews.

The report describes the methodology used in the construction of a three-dimensional aircraft movement operating in the Los Angeles Basin Area. From data obtained, the Los Angeles Basin Air Traffic Model of 1972 was constructed. The model contains approximately 80% VFR flight operations, and represents a particular time period of nonpeak aircraft operations which occurred during a three-hour period on the 20th of August 1972. The purpose of the traffic sample is to develop a standard model to test future air traffic systems and equipment. Since most air traffic operation models are generally made from IFR-controlled operations, this is the first of a series of air traffic models that include both IFR and VFR operations. (Modified author abstract)

AD-767 259/5GA PC$4.25/MF$1.45
LTV Aerospace Corp Warren Mich Michigan Div
FEASIBILITY DEMONSTRATION OF AN INFRARED TERMINALLY GUIDED SUBMISSILE.
Final rept. (Appendices).
31 Jul 73, 112p Rept no. 7-52100/73R-9
Contract DAAH01-71-C-0855

Descriptors: (*Heat homing, *Terminal guidance), (*Guided missiles(Air-to-surface), Feasibility studies), Telemeter systems, Specifications, Guided missile components, Guided missile trajectories, Computer programs, Inventory analysis, Infrared equipment, Homing devices.
Identifiers: *Submissiles.

Contents:
- Accounting of fabricated hardware;
- Drawing numerical list and telemetry drawing family tree;
- Advanced submissile preliminary engineering analysis;
- List of reports, procedures, and specifications;
- Parts breakdown list.

AD-767 386/6GA PC$2.75/MF$1.45
Texas A and M Univ College Station Dept of Oceanography
DEVELOPMENT AND INSTALLATION OF SPEED, HEADING, AND TELETYPE INTERFACE TO MAGNAVOX MX706CA SATELLITE NAVIGATION SET.
Technical rept.,
James Stasny, and Alan Payne. Aug 73, 11p Rept no. A/M-Ref-73-12-T
Contract N00014-68-A-0308-0002

Descriptors: (*Radio navigation, Input-output devices), Interfaces, Teletype systems, Navigation satellites, Radio equipment.

The report describes the design and operation of interfacing for automatic external speed and heading sensors and also hard copy printout.

AD-767 394/0GA PC$3.50/MF$1.45
California Univ Berkeley Space Sciences Lab

THE USE OF A SHIP-BORNE LONG-BASELINE MICROWAVE INTERFEROMETER FOR NAVIGATION.
Final rept.,
Michael A. Morgan. Aug 73, 67p Rept no. Series-14-Issue-70
Contract N00014-69-A-0200-1047

Descriptors: (*Radio interferometers, *Position finding), Navigation, Microwave equipment, Shipborne.

The subject of this report is an examination of the feasibility of using a long-baseline interferometer aboard a ship as a navigational device. The ideal theoretical resolution of such an interferometer with a correlation-receiver has the potential of determining the latitude and longitude of a ship at sea with great accuracy. The report provides the framework for computing position from certain types of data and deals with the special considerations of interferometry pertinent to a navigational system and the navigational technique proper.

AD-767 452/6GA PC$6.50/MF$1.45
Collins Radio Co Cedar Rapids Iowa
EVALUATION OF EXISTING VOR, LOCALIZER, AND GLIDESCOPE RECEIVING EQUIPMENT. VOLUME II, BOOK 2. EVALUATION OF PERFORMANCE WHEN OPERATING IN A 50-KHZ VOR/LOCALIZER, 150-KHZ GLIDESLOPE (SPLIT CHANNEL) RF ENVIRONMENT.
Final rept.,
Wayne O. Ashby. Feb 73, 300p Rept no. 523-0764695-00111M-Vol-2-2 FAA-RD-73-1-Vol-2-2
Contract DOT-FA72WA-2772
See also AD-765 154.

Descriptors: (*Radio navigation, Electromagnetic compatibility), (*Radio receivers, Electromagnetic compatibility), (*Glide path systems, Electromagnetic compatibility), Instrument landings, Data, Graphics, Air traffic control systems.
Identifiers: VOR, Graphs(Charts).

Each receiver was tested under various conditions of interference in a simulated environment with an interfering adjacent channel signal (50 kHz VOR and Localizer; 150 kHz Glideslope). Some 61 types of receivers, representing all user groups, were tested. The objective was to provide data on which to base geographic facility separations. Volume II provides, in graphical form, basic test results for each individual test, and consists of two books. Book 1 also includes the detailed test plan and an explanation of the areas of interest on the data plots. (Author)

AD-767 453/4GA PC$3.50/MF$1.45
Meta Systems Inc Santa Clara Calif
POTENTIAL CONFLICT PREDICTION AND ASSOCIATED FUNCTIONS FOR OCEANIC AIR TRAFFIC CONTROL AUTOMATION.
Final rept. Mar 72-May 73,
Frank V. Giallanza, Charles P. Giallanza, and James C. Brown. May 73, 58p* FAA-RD-73-73
Contract DOT-FA72WA-2851

Descriptors: (*Air traffic control systems, Automation), Air traffic, Computer programs, Predictions, Scheduling, Oceans.
Identifiers: Routing.

Algorithms to determine potential conflicts over an ocean airspace based on given vertical, lateral, and longitudinal separation criteria were developed. Additional algorithms to handle special cases have yet to be developed. Associated functions used by air traffic controllers to resolve conflict situations are also described. (Author) Portions of this document are not fully legible.

AD-767 455/9GA PC$5.50/MF$1.45
Westinghouse Electric Corp Baltimore Md Aerospace and Electronic Systems Div
MODIFICATION AND TEST INSTRUMENT LANDING SYSTEM GLIDE SLOPE WAVEGUIDE ANTENNA.
Interim rept. Dec 71-Apr 73 on Phase 2,
R. A. Moore, G. Moussally, T. Parker, and S. F. Payer. Jun 73, 206p FAA-RD-73-78
Contract DOT-FA71WA-2666
See also AD-759 213.

Descriptors: (*Glide path systems, *Antennas), Instrument landings, Monitors, Antenna lobes, Tests, Waveguides.

The report covers Phase II of an FAA sponsored modification and test of a sixty foot waveguide glide slope antenna to provide Category II performance at problem sites. Compensating elements for sidelobe cancellation were designed, tested, and installed at each end of the sixty foot waveguide antenna. A series of radiation pattern tests under various antenna operating conditions were performed. A flight test program was carried out in an environment relevant to both flat and broken ground and rising terrain in the approach area under conditions of compensation and non-compensation. The design, installation, and test of an aperture monitor system is also described. (Author)

JPRS-60001/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
GYROSTABILIZERS,
Yu. A. Borisov, Yu. V. Osetinskii, and S. M. Zeldovich. 11 Sep 73, 19p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) n6 p81-86 1973.

Descriptors: (*Gyrostabilizers, Reliability), Errors, Resonance, Stability, USSR.

The report contains articles on errors in a uniaxial gyrostabilizer as an angular velocity integrator, on combination parametric resonance in a gyropendulum installed on a moving base and on the stability of an indicating gyrostabilizer on rotation of a three-stage gyroscope.

N73-27115/7GA PC$6.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
VANGUARD/PLACE EXPERIMENT SYSTEM DESIGN AND TEST PLAN.
R. E. Taylor. Apr 73, 86p NASA-TM-X-66287, X-752-73-117

Descriptors: *Ats 5, *Navigation aids, *Position (Location), *Radio communication, *Surface navigation, Equipment specifications, Performance tests, Systems engineering.

For abstract, see STAR 1118

N73-27183/5GA PC$3.00/MF$1.45
Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Apparate.
FURTHER DEVELOPMENT OF THE AUTOMATIC FLIGHT OPERATIONS SYSTEM AOOSY FOR THE INTEGRATED SATELLITE CONTROL SYSTEM ISK WEITERENTWICKLUNG DES AUTOMATISCHEN FLUGBETRIEBSSYSTEMS AOOSY ZUM INTEGRIERTEN SATELLITENKONTROLLSYSTEM ISK.
P. Kuhn, and J. Roosen. 10 Apr 72, 8p MBB-UA-56-72-O, DGLR-PAPER-72-025
Conf-Presented at the Dglr Symp. On Bodeneinrichtungen fuer Raumfahrzeuge, Munich, 12-13 Apr. 1972.
Language in German.

Descriptors: *Automatic flight control, *Azur satellite, *Satellite control, Command and control, Space missions.

For abstract, see STAR 1118

N73-27567/9GA PC$11.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
SIRU DEVELOPMENT. VOLUME 3: SOFTWARE DESCRIPTION AND PROGRAM DOCUMENTATION.
Final Report.
J. Oehrle. Mar 73, 193p NASA-CR-128965, R-746-VOL-3
Contract NAS9-8242

Descriptors: *Computer programs, *Inertial navigation, *Strapdown inertial guidance, *Systems analysis, Accelerometers, Data processing equipment, Equipment specifications, Gyrostabilizers.

For abstract, see STAR 1118

N73-27569/5GA PC$6.25/MF$1.45
Weston Instruments, Inc., College Park, Md. EMR Aerospace Sciences.
PANORAMIC ATTITUDE SENSOR FOR RADIO ASTRONOMY EXPLORER B.
Final Report, Jul. 1971 - Jan. 1973.
R. Thomsen. Jun 73, 82p NASA-CR-132782
Contract NAS5-11464

Descriptors: *Attitude control, *Radio astronomy explorer satellite, Lunar orbits, Scanners, Solar radiation.

For abstract, see STAR 1118

N73-27570/3GA PC$8.25/MF$1.45
Weston Instruments, Inc., College Park, Md. EMR Aerospace Sciences.
PANORAMIC ATTITUDE SENSOR FOR RADIO ASTRONOMY EXPLORER-B, APPENDICES.
Final Report.
Jun 73, 123p NASA-CR-132783
Contract NAS5-11464

Descriptors: *Attitude control, *Radio astronomy explorer satellite, Lunar orbits, Scanners, Solar radiation.

For abstract, see STAR 1118

N73-27571/1GA PC$3.25/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
A STAR-POINTING ATTITUDE CONTROL SYSTEM FOR SKYLARK.
J. K. Abbott. Dec 71, 25p RAE-TR-71241, BR28129

Descriptors: *Attitude control, *Pointing control systems, *Skylark rocket vehicle, *Star trackers, *Strapdown inertial guidance, Moon, Rocket-borne instruments, Target acquisition.

For abstract, see STAR 1118

N73-28649/4GA PC$5.25/MF$1.45
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
DEVELOPMENT OF A WIDTH-MODULATED PULSE REBALANCE ELECTRONICS LOOP FOR STRAPDOWN GYROSCOPES.
T. V. Blalock, E. J. Kennedy, and R. D. Mcknight. 13 Jul 73, 65p NASA-CR-124333, S-25
Contract NAS8-27296

Descriptors: *Current regulators, *Pulse duration modulation, Closed cycles, Gyroscopic stability, Strapdown inertial guidance.

For abstract, see STAR 1119

PATENT-3 725 682/GA Not available NTIS
Department of the Navy Washington D C

ONE SHOT MULTIVIBRATOR FOR VARIABLE WIDTH VIDEO EDGE DETECTOR.
Patent,
David Rubin, and John B. Seybold. Filed 14 Apr 71, patented 3 Apr 73, 5p Rept nos. PAT-APPL-134 064,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Video map matching, *Patents), (*Relaxation oscillators, Video map matching), Correlators, Analog systems.
Identifiers: PAT-CL-307-273, *Multivibrators.

The patent describes a device, used with an analog video correlation, for edge detecting the video input from two TV cameras to immediately discern the time correlations peak from past or future partial correlation peaks providing dependable real time map matching.

PATENT-3 744 913/GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DEVICE FOR DETERMINING RELATIVE ANGULAR POSITION BETWEEN A SPACECRAFT AND A RADIATION EMITTING CELESTIAL BODY.
Patent.
W. H. Farthing, and H. F. Frisbie. Patented 10 Jul 73, 9p NASA-CASE-GSC-11444-1,
Misc-Filed 24 Feb. 1972 Supersedes N72-21418 (10 - 12, p 1608).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Angular correlation, *Celestial bodies, *Spacecraft position indicators, Patents, Radiation detectors, Semiconductor devices, Signal processing, Space orientation, Spin stabilization.

Signals indicative of the relative angular position between a spin stabilized spacecraft, probe, or sounding rocket and a radiation emitting celestial body are derived with a detector including four electrodes for deriving indications of the centroid of the radiation image on the detector. During each spin of the satellite each electrode derives a signal having a first non-zero level while the detector is not illuminated by the radiation, and a sound non-zero level while it is illuminated by the radiation.

17H. Optical Detection

N73-27173/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DESIGN AND EVALUATION OF AN OPTICAL FINE-POINTING CONTROL SYSTEM FOR TELESCOPES UTILIZING A DIGITAL STAR SENSOR.
A. J. Ostroff, and K. C. Romanczyk. Jul 73, 66p NASA-TN-D-7204, L-8677

Descriptors: *Compensatory tracking, *Large space telescope, *Pointing control systems, *Star trackers, Astronomical telescopes, Servocontrol, Spaceborne telescopes, Structural design.

For abstract, see STAR 1118

N73-28872/2GA PC$3.75/MF$1.45
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
STOPWATCH OBSERVATIONS OF SATELLITES MADE DURING THE MONTH OF MARCH 1973.
R. D. Eberst. 18 Apr 73, 35p ROE-STS-151

Descriptors: *Cosmos satellites, *Optical tracking, *Satellite tracking, Agena d rocket vehicle, Explorer satellites, Heos b satellite, Nimbus satellites, Ogo, Td-1 satellite, Transit satellites.

For abstract, see STAR 1119

N73-28873/0GA PC$3.50/MF$1.45
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
STOPWATCH OBSERVATIONS OF SATELLITES MADE DURING THE MONTH OF APRIL 1973.
R. D. Eberst. 22 May 73, 26p ROE-STS-152

Descriptors: *Cosmos satellites, *Optical tracking, *Satellite tracking, Agena d rocket vehicle, Ariel 4 satellite, Esro 4 satellite, Explorer satellites, Heos b satellite, Nimbus satellites, Ogo.

For abstract, see STAR 1119

PATENT-3 678 279/GA Not available NTIS
Department of the Air Force Washington D C
AUTOMATIC VARIABLE GAIN OPTICAL TRACKER FOR SPACE VEHICLES COMPRISING D-C SYSTEM FOR ERROR. SIGNAL GENERATION.
Patent,
Louis S. Macknik, and Kenneth E. Kissell. Filed 2 Jun 70, patented 18 Jul 72, 5p Rept nos. PAT-APPL-42 648,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Satellite tracking systems, Optical tracking), (*Optical tracking, *Patents), (*Signal generators, Optical tracking), Optical equipment, Errors, Spacecraft, Optical scanning.
Identifiers: PAT-CL-250-203.

The patent describes an optical scanning system which is substantially independent of target brightness and fluctuations in target brightness over a wide brightness range.

PATENT-3 706 496/GA Not available NTIS
Office of the Secretary of the Army Washington D C
CINETHEODOLITE.
Patent,
George Geier, and William E. Mimmack. Filed 13 Jan 71, patented 19 Dec 72, 5p Rept nos. PAT-APPL-106 211,
Previously filed as PAT-APPL-669 319, 20 Sep 67.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Phototheodolites, *Patents), Optical tracking, Guided missile tracking systems.
Identifiers: PAT-CL-356-149.

The invention relates to theodolites and refers more particularly to a cinetheodolite having improved accuracy. Theodolite principles are widely used for tracking guided missiles. Instruments using these principles are used mainly for determining elements of trajectory. These elements are position and velocity coordinates. The object of the invention is to provide an optical theodolite which overcomes many of the disadvantages of the prior devices and to provide an optical theodolite which eliminates the effects of dynamic error sources.

17I. Radar Detection

AD-767 209/0GA MF$1.45
Technology Service Corp Santa Monica Calif
ADAPTIVE RADAR TECHNIQUES. VOLUME I. COMPUTER STUDIES OF ADAPTIVE SUBARRAY RADAR.
Final rept.,
Worthie L. Doyle, and Lawrence E. Brennan. Jul 73, 137p Rept no. TSC-PD-353-2-1 RADC-TR-73-194-Vol-1
Contract F30602-72-C-0253
See also report dated Jul 73, AD-676 210.
Availability: Available in microfich only.

Descriptors: (*Radar antennas, Adaptive systems), Antenna arrays, Antenna radiation patterns, Computer programs, Radar jamming, Performance(Engineering).
Identifiers: Chaff.

The final report on an adaptive radar techniques is contained in two volumes. The second volume discusses angle tracking with adaptive array radar. Volume I discusses adaptive array antenna techniques for ground-based radar and contains a generalized computer program for investigation of adaptive array radar in an environment containing jammers and/or distributed clutter. In many-element arrays, complexity can be reduced by forming subarray outputs which are then combined with adaptively controlled weights. This reduces the number of adaptive control circuits at some cost in array performance. Various types of subarraying are compared. The report also discusses the use of a notched-omni transit signal to permit adaptive sidelobe reduction when clutter or chaff extends into the main beam. Performance of various adaptive antenna configurations in a blinking jammer environment is considered. (Author)

AD-767 210/8GA PC$3.50/MF$1.45
Technology Service Corp Santa Monica Calif
ADAPTIVE RADAR TECHNIQUES. VOLUME II. ANGLE TRACKING WITH AN ADAPTIVE ARRAY.
Final rept.,
Roderic C. Davis, and Lawrence E. Brennan. Jul 73, 51p Rept no. TSC-PD-353-2-2 RADC-TR-73-194-Vol-2
Contract F30602-72-C-0253
See also report dated Jul 73, AD-767 209.

Descriptors: (*Radar antennas, Adaptive systems), Phased arrays, Radar tracking, Antenna radiation patterns, Radar jamming, Optimization, Performance(Engineering).
Identifiers: Computerized simulation, Maximum likelihood estimation.

The final report on an adaptive radar techniques study is contained in two volumes. The first volume contains the results of a computer study of adaptive receiving array antennas for radar. This Volume II describes a technique for angle tracking with adaptive array antennas. As in conventional monopulse systems, two receiving beams are formed: a sum beam (Sigma) and a difference beam (Delta). Each of these beams is formed with adaptively controlled weights which generate antenna patterns with nulls on sidelobe jammers. Since the array weights and antenna patterns vary with the external noise field distribution, the conventional angle estimator Sigma/Delta does not provide an accurate angle estimate. An expression for estimating target angle off boresight, based on the Sigma and Delta beam outputs and the adaptive weights, is derived in this report. Simulation results show that this angle estimation equation and the adaptive Sigma and Delta array outputs provide good angle tracking accuracy in jamming environments where conventional non-adpative monopulse tracking fails. (Author)

AD-767 238/9GA PC$3.50/MF$1.45
Army Electronics Command Fort Monmouth N J
COMPUTER-AIDED DESIGN OF RADAR SIGNALS USING THE AMBIGUITY FUNCTIONS.
Technical rept.,
John V. Medea. Sep 73, 72p Rept no. ECOM-4149
Errata sheet inserted.

Descriptors: (*Radar signals, Design), Graphics, Curve fitting, Computer programs, Doppler effect, Radar targets.
Identifiers: Computer aided design, *Ambiguity functions, PDP-9/339 computers, Signal processing, FORTRAN 4 programming language, Waveforms, FORTRAN.

The report documents the development of a computer-aided design program for determining the

resolving power of radar signals from their ambiguity functions. The program computes the ambiguity function for any finite signal envelope and displays it on a graphics terminal. It is currently operational on the PDP-9/339 Remote Graphics Terminal and the Tektronix 4010 terminals at the University of Michigan. (Author)

AD-767 298/3GA PC$4.75/MF$1.45
Alabama Univ Huntsville
STUDIES OF MULTIPLE TARGET TRACKING, CONSTANT-FALSE--ALARM-RATE AND GLINT FOR THE EAR SYSTEM.
Interim technical rept. May 72-May 73,
Robert J. Polge, Roy D. Hays, B. K. Bhagavan, Louis Callas, and Earl R. McKee. Jul 73, 163p
Rept no. UAH-RR-147
Contract DAAH01-71-C-1181

Descriptors: (*Radar tracking, Multiple operation), Radar equipment, Errors, Computer programs, Mathematical models, Simulation.
Identifiers: Experimental array radar, Computerized simulation, FORTRAN 4 programming language, FORTRAN.

The report is a continuation of the experimental array radar simulation studies. The main objectives are to: (1) expand and exercise the baseline EAR simulation program to include multiple target handling, (2) analyze and design a constant-false-alarm rate processor, and (3) investigate the effect of glint error on tracking performance and glint reduction through the use of linear FM frequency agility or both. (Modified author abstract)

AD-767 317/1GA PC$3.50/MF$1.45
General Research Corp Santa Barbara Calif
REFRACTION BY A SINGLE COLUMNAR PLASMA.
Topical rept.,
C. R. Mullin. Nov 72, 53p Rept no. GRC-RM-1718
DNA-3109F
Contract DNA001-72-C-0226

Descriptors: (*Radar tracking, Refraction), (*Plasma medium, Radar pulses), Radar tracking, Radar echo areas, Electron density, Track-while-scan, Transcendental functions, Green's function.

In the paper, the author examines the question of just what a radar sees when it tracks a target moving behind a columnar plasma. It is found that refraction by even weak plasmas can generate multiple images at various apparent ranges and angular locations, and that these images will have large variations in their radar cross sections and trajectories. An illustrative numerical example is worked out exactly, and is contrasted with the comparable solutions obtained by refraction approximations used in the RANC and HARC programs. It is found that the domain over which these approximations are useful depends rather strongly on the radar mode under consideration, i.e., search, track-while-scan, track, etc. In the case of a track radar, the nature of the tracking filter also determines the appropriateness of the approximation. (Author)

PATENT-3 689 922/GA Not available NTIS
Department of the Air Force Washington D C
RADAR SYSTEM LOGIC CIRCUIT.
Patent,
Calvert F. Phillips, Jr. Filed 23 Mar 66, patented 5 Sep 72, 3p Rept nos. PAT-APPL-538 173,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Radar equipment, Logic circuits), (*Patents, *Logic circuits), Signal-to-noise ratio, Switching circuits.
Identifiers: PAT-CL-343-17-1-R.

The patent describes a dual frequency radar system that automatically switches from a resistive mixer of two receiving channels to a peak value selector. The switching is determined by the presence of signals in each channel above a given threshold.

SLA-73-519/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
TERRAIN RECOGNITION COMPUTER SIMULATION.
J. A. Cooper, and L. M. Melick. May 73, 20p

Descriptors: (*Topography, *Simulation), (*Radar, *Reflection), Computers.

For abstract, see NSA 28 03, number 07788.

17J. Seismic Detection

AD-767 208/3GA PC$3.75/MF$1.45
Rome Air Development Center Griffiss AFB N Y
RADC SEISMIC CLASSIFIER DESIGN.
Technical rept.,
Albert H. Proctor, James E. Roach, and Michael H. Fick. Aug 73, 98p Rept no. RADC-TR-73-221

Descriptors: (*Microseisms, Target discrimination), (*Seismic waves, *Pattern recognition), Sensors, Vehicles, Humans, Power spectra, Helicopters, Transport planes, Computer programs.
Identifiers: *Seismic detection, Computer graphics, C-131 aircraft, Signal processing, OLPARS(On Line Pattern Analysis and Recognition Systems), On line pattern analysis and recognition systems.

The report describes the design and evaluation of seismic classifiers for distinguishing among humans, heavy trucks, armored personnel carriers, helicopters, and C-131 aircraft. The data used to develop these classifiers consisted of many digitized seismometer responses to each of the intrusion targets and was collected by the Sensor Development Section of the Surveillance and Control Division at the West Lee Test Site. The Interactive Processing Section of the Information Sciences Division analyzed this waveform data and extracted an initial set of 48 features. The on-line pattern analysis and recognition system (OLPARS) was then used to develop several seismic classifier designs which are based on different subsets of the initial 48 features. (Modified author abstract)

PATENT-3 699 909/GA Not available NTIS
Office of the Secretary of the Army Washington D C
SEISMIC SYSTEM FOR REAL-TIME REPORTING.
Patent,
Kenneth A. Hirschberg. Filed 21 Oct 69, patented 17 Oct 72, 6p Rept nos. PAT-APPL-868 142,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Seismometers, *Patents), (*Warning systems, Detectors), Seismic waves, Sensors, Electronic equipment, Radio transmission, Real time, Wiring diagrams.
Identifiers: PAT-CL-340-15, Seismic detection, Personnel detection.

The invention relates to seismic systems for remote monitoring of roads and trails in order to determine the volume and direction of traffic thereon. Accordingly, an object of the invention is apparatus for detecting movement of troops or equipment which may occur at either one or two-spaced locations along a path and the direction of such movement if it passes between the spaced locations.

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

CONF-730315-10/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
HYDROMAGNETIC WAVE HEATING OF TOKAMAK PLASMAS.
F. W. Perkins, M. Chance, and J. M. Kindel. 4p
Contract AT(11-1)-3073

Descriptors: (*Plasma, *Heating), (*Hydromagnetic waves, Heating), (*Tokamak devices, Heating), Cyclotron resonance, Ions.

For abstract, see NSA 28 02, number 04295.

CONF-730315-12/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
INTERPRETATION OF MAGNETIC DISTURBANCES OBSERVED IN TOKAMAKS.
P. H. Rutherford. 4p
Contract AT(11-1)-3073

Descriptors: (*Tokamak devices, *Magnetic fields), Eddy currents, Electric currents, Oscillations, Plasma instability.

For abstract, see NSA 28 02, number 04362.

CONF-730315-8/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
ADIABATIC COMPRESSION OF THE TOKAMAK DISCHARGE.
K. Bol, R. A. Ellis, H. Eubank, H. P. Furth, and R. A. Jacobson. 1972, 4p
Contract AT(11-1)-3073

Descriptors: (*Atc devices, *Heating), (*Plasma, Heating), Adiabatic processes, Compression, Ion temperature.

For abstract, see NSA 28 02, number 04293.

CONF-730315-9/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
SIMULATION OF TOKAMAK CONFINEMENT PROBLEMS ON FM-1.
K. Chen, D. Meade, M. Okabayashi, J. A. Schmidt, and S. Yoshikawa. 4p
Contract AT(11-1)-3073

Descriptors: (*Plasma simulation, Fm devices), (*Fm devices, *Confinement), (*Plasma, Confinement), Magnetic fields, Spherator, Tori.

For abstract, see NSA 28 02, number 04294.

LA-5145-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LASER CTR SYSTEMS STUDIES.
J. M. Williams. Mar 73, 9p
Contract W-7405-eng-36

Descriptors: (*Laser-produced plasma, Thermonuclear reactors), (*Thermonuclear reactors, *Design), Nuclear fuels, Planning, Shielding.

For abstract, see NSA 28 02, number 04363.

LA-5178-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
RADIAL COLLAPSE OF A DENSE PLASMA SPINDLE FOCUS.
K. D. Ware, and J. W. Mather. Apr 73, 7p
Contract W-7405-eng-36

Descriptors: (*Plasma focus, *Thermonuclear reactions), Argon, Compression, Confinement, Deuterium, Neutrons, Pinch effect, Plasma, Plasma density, Plasma sheath, Shock waves, X radiation.

For abstract, see NSA 28 02, number 04364.

LA-5218-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
OPTIMIZATION OF THE SUPERCONDUCTING SWITCH DESIGN IN A SUPERCONDUCTING MAGNETIC ENERGY STORAGE SYSTEM.
D. M. Weldon, J. D. G. Lindsay, and H. L. Laquer. Mar 73, 17p

Descriptors: (*Energy storage, *Superconductors), (*Switches, *Specifications), (*Thermonuclear reactors, Energy storage), Cryogenics, Economics, Efficiency, Heating, Plasma.

For abstract, see NSA 28 03, number 07161.

N73-27182/7GA PC$3.75/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE TRANSIENT BEHAVIOR OF CURRENTS AND FORCES IN THE COIL SYSTEM OF THE STELLARATOR W 7 ESPECIALLY DURING OPERATIONAL DISTURBANCES.
H. Preis. Aug 73, 36p NASA-TT-F-15014, IPP-4/109
Contract NASW-2483
Tran-Transl. Into English of "Das Transiete Verhalten von Stroemen und Kraeften im Spulensystem des Stellarators W 7 Insbesondere Beibetriebsstoerungen", Max-Planck-Inst. Fue Plasmaphys., Garching Rept. No. Ipp-4/109, Mar. 1973 36 p.

Descriptors: *Lorentz force, *Magnet coils, *Stellarators, *Transient response, Differential equations, Magnetic induction, Pulse generators, Short circuits, Toroids.

For abstract, see STAR 1118

N73-27595/0GA PC$3.25/MF$1.45
Scientific Translation Service, Ann Arbor, Mich.
CALCULATION OF TRANSIENT CURRENTS AND FORCES IN TOROIDAL COIL SYSTEMS FOR FUSION MACHINES.
R. Pohlchen, and H. Preis. Aug 73, 21p NASA-TT-F-15013, IPP-4/107
Contract NASW-2483
Tran-Transl. Into English from Max-Planck-Inst. Fuer Plasmaphys., Garching, West Germany, Report Ipp-4/107.

Descriptors: *Magnetic fields, *Stellarators, *Toroidal plasmas, Electrical properties, Numerical analysis, Test facilities, Transient response.

For abstract, see STAR 1118

ORNL-TM-3096/GA PC$6.50/MF$1.45
Oak Ridge National Lab., Tenn.
CONCEPTUAL DESIGN OF THE BLANKET AND SHIELD REGION AND RELATED SYSTEMS FOR A FULL SCALE TOROIDAL FUSION REACTOR.
A. P. Fraas. May 73, 86p
Contract W-7405-eng-26

Descriptors: (*Thermonuclear reactors, *Breeding blankets), Boundary conditions, Coolant loops, Design, Planning, Shielding, Tori.

For abstract, see NSA 28 02, number 04365.

ORNL-TM-4156/GA PC$7.50/MF$1.45
Oak Ridge National Lab., Tenn.
FUSION TECHNOLOGY STUDIES PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1972.
C. J. McHargue. May 73, 110p
Contract W-7405-eng-26

Descriptors: (*Thermonuclear reactors, *Reactor materials), Corrosion, Leading abstract, Lithium, Metallurgy, Physical radiation effects.

For abstract, see NSA 28 02, number 04366.

ORO-3557-14/GA PC$3.00/MF$1.45
Roanoke Coll., Salem, VA. Dept. Of Physics.
PROTON SPUTTERING. SEVENTH ANNUAL PROGRESS REPORT, JUNE 1, 1972--FEBRUARY 28, 1973.
C. R. Finfgeld. 1973, 8p
Contract AT(40-1)-3557

Descriptors: (*Hydrogen ions 1 plus, *Collisions), (*Deuterium ions, Collisions), (*Tungsten, *Sputtering), (*Gold, Sputtering), Ev range 100-1000, Kev range 01-10.

For abstract, see NSA 28 03, number 06670.

UCID-16235/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
GEOMETRIC EFFECTS IN NEUTRAL INJECTION INTO BASEBALL II.
T. K. Fowler. 3 Mar 73, 21p

Descriptors: (*Baseball devices, Plasma instability), (*Plasma instability, *Beam injection), Charge exchange, Configuration, Scattering.

For abstract, see NSA 28 03, number 07151.

UCRL-51351/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
CRITERIA FOR DESIGN OF AN ADIABATIC EXPANDER FOR A DIRECT ENERGY CONVERTER.
R. W. Moir, and J. D. Lee. 15 Feb 73, 20p
Contract W-7405-eng-48

Descriptors: (*Direct energy converters, *Design), (*Thermonuclear reactors, Direct energy converters), Adiabatic processes, Expansion, Planning.

For abstract, see NSA 28 02, number 04368.

18B. Isotopes

AEMC/Chem.Engg-127/GA PC$5.75/MF$1.45
Atomic Energy Minerals Centre, Lahore (Pakistan).
ISOTOPE SEPARATION BY THE NOZZLE SEPARATION PROCESS. A BIBLIOGRAPHY.
S. Khan, and M. Saleem. Mar 73, 75p
U.S. Sales Only.

Descriptors: (*Separation nozzle method, *Bibliographies), Isotope enriched materials, Uranium 235.

For abstract, see NSA 28 02, number 02786.

BNWL-1308-13/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
PACIFIC NORTHWEST LABORTORY, ISOTOPE DEVELOPMENT PROGRAMS QUARTERLY REPORT: NOVEMBER 1972--JANUARY 1973.
J. H. Jarrett. Mar 73, 28p
Contract AT(45-1)-1830

Descriptors: (*Isotope applications, *Research programs), (*Xenon isotopes, Isotope applications), (*Strontium fluorides, *Stability), (*Radioisotopes, *Isotope production), Americium oxides, Americium 241, Blood, Capsules, Cesium 137, Chemical preparation, Exploration, Extracorporeal irradiation, Fabrication, Hastelloys, Irradiation devices, Krypton 85, Medicine, Minerals, Nitrogen 13, Platinum, Plutonium 238, Promethium 147, Qualitative chemical analysis, Radiation detectors, Radiation sources, Seas, Sputtering, Stainless steels, Strontium 90, Thulium 170, Underwater, Waste processing, Yttrium 90.

For abstract, see NSA 28 03, number 05877.

CEA-R-4394/GA PC$4.75/MF$1.45
Commissariat a l'Energie Atomique, Bruyeres-le-Chatel (France). Centre d'Etudes.
MEASUREMENTS OF RADIOACTIVE GASES.
J. Colomer, H. Celier, and C. Humbert-Droz. Mar 73, 54p
In French. U.S. Sales Only.

Descriptors: (*Tritium, *Radiometric analysis), (*Krypton 85, Radiometric analysis), (*Xenon 133, Radiometric analysis), (*Carbon 14, Radiometric analysis), Accuracy, Argon 37, Gases, Liquid scintillation detectors, Proportional counters, Solid scintillation detectors.

For abstract, see NSA 28 02, number 02646.

CNEA-327/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
HEAT CONTROL IN COMPOUNDS MARKED WITH /SUP 99M/TC.
S. G. de Castiglia, S. J. Cembal, A. H. Fraga de Suarez, J. O. Nicolini, and M. G. Noto. 1972, 12p
In Spanish. U.S. Sales Only.

Descriptors: (*Technetium 99, *Isotope production), (*Technetium compounds, *Quality control), Impurities, Isomeric nuclei, Ketones, Labelled compounds, Labelling, Particle size, Radioisotope generators, Solvent extraction, Toxicity.

For abstract, see NSA 28 02, number 02394.

CONF-730618-2/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
DEVELOPMENTS IN THE ORNL PROGRAM.
L. O. Love. 24p

Descriptors: (*Electromagnetic isotope separation, *Reviews), Ornl.

For abstract, see NSA 28 03, number 05848.

FRNC-CONF-80/GA PC$3.00/MF$1.45
Ugine-Kuhlmann, Levallois-Perret (France). Laboratoire Central de Recherches Produits Chimiques.
POSSIBLE INDUSTRIAL APPLICATIONS OF EXP 252 CF SOURCES IN ACTIVATION ANALYSIS.
J. L. Verot. 1972, 10p CONF-721069-38
In French. U.S. Sales Only.

Descriptors: (*Californium 252, *Neutron sources), (*Fluorine, *Activation analysis), (*Hafnium, Activation analysis), Accuracy, Neutron beams, Nondestructive testing, Sensitivity, Trace amounts.

For abstract, see NSA 28 03, number 05099.

GAT-675/GA PC$4.00/MF$1.45
Goodyear Atomic Corp., Piketon, Ohio.
URANIUM ISOTOPE SEPARATION BY CHEMICAL EXCHANGE REACTIONS BETWEEN UF SUB 6 AND NOUF SUB 6 IN A TWO-PHASE LIQUID SYSTEM.
R. P. Nugent. 5 Mar 72, 22p
Contract AT(33-2)-1

Descriptors: (*Uranium 235, *Isotope separation), (*Uranium 238, Isotope separation), Enriched uranium, Freons, Isotopic exchange, Uranium hexafluoride.

For abstract, see NSA 28 02, number 02306.

N73-28701/3GA PC$3.00/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden).
EXPERIMENT AND OBSERVATION OF ISOTOPE AND ELEMENT SEPARATION IN A PLASMA WITH COSMICAL APPLICATIONS.
S. Bonnevier. Apr 72, 6p TRITA-EPP-72-27
Conf-Presented at the Symp. On the Origin of the Solar System, Nice, 3-7 Apr. 1972.

Descriptors: *Isotope separation, *Rare gases, *Rotating plasmas, *Solar system, Abundance, Centrifugal force, Solar wind.

For abstract, see STAR 1119

ORNL-TM-4251/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ISOTOPE PROGRAM (5000) PROGRESS REPORT FOR QUARTER ENDING MARCH 31, 1973.
J. H. Gillette. May 73, 18p
Contract W-7405-eng-26

Descriptors: (*Isotopes, *Research programs), (*Targets, *Fabrication), (*Stable isotopes, *Isotope separation), (*Radioisotopes, Isotope separation), Brazing, Dosemeters, Molybdenum, Molybdenum isotopes, Osmium, Plutonium 242, Samarium 151, Silicon isotopes, Silver 110, Tracer techniques, Trade, Uranium dioxide, Uranium 235.

For abstract, see NSA 28 03, number 05849.

ORNL-4788/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
SOME RADIOISOTOPE ASSAY METHODS.
S. A. Reynolds. Mar 73, 29p
Contract W-7405-eng-26

Descriptors: (*Radiation sources, *Calibration standards), Laboratory equipment, Personnel, Quality control, Radioisotopes.

For abstract, see NSA 28 03, number 07208.

ORNL-4872/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
ANOMALOUS BEHAVIOR IN THE KINETICS OF PHASE TRANSFORMATION IN CSCL--KCL SYSTEM.
K. H. Lin, and D. N. Braski. May 73, 41p
Contract W-7405-eng-26

Descriptors: (*Gamma sources, *Thermal expansion), (*Cesium 137, Gamma sources), (*Cesium chlorides, *Phase transformations), (*Potassium chlorides, Phase transformations), Impurities, Phase diagrams, Temperature dependence, Thermal cycling.

For abstract, see NSA 28 03, number 05867.

ORO-2401-60/GA PC$4.50/MF$1.45
Vanderbilt Univ., Nashville, Tenn.
RADIOISOTOPE STUDIES UTILIZING A LOW LEVEL WHOLE-BODY COUNTER AND CLINICAL APPLICATIONS OF ACTIVATION ANALYSIS. PROGRESS REPORT, 1972--1973.
1973, 47p
Contract AT(40-1)-2401

Descriptors: (*Iron 58, *Activation analysis), (*Blood plasma, Activation analysis), Dosimetry, Quantitative chemical analysis, Research programs.

For abstract, see NSA 28 03, number 05101.

PAT-APPL-380046/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PRODUCTION OF I-123.
Patent Application.
J. W. Blue. Filed 17 Jul 73, 12p NASA-CASE-LEW-11390-3,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Clinical medicine, *Heat pipes, *Iodine isotopes, *Particle production, Diagnosis, High energy interactions, Patent applications.

The production of I-123 from cesium bombardment by high energy protons in a heat pipe is examined. A spallation reaction produces Xe-123 and many other radioactive contaminants which pass from the heat pipe to low temperature traps where undesirable contaminants are removed. Xenon is held for a period of time sufficient for it to decay into I-123.

RT/ING-(72)18/GA PC$21.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
HEAVY WATER PRODUCTION. INDUSTRIAL PROCESSES AND PLANTS. (A BIBLIOGRAPHY).
D. Lavrencic. 14 Sep 72, 389p
U.S. Sales Only.

Descriptors: (*Heavy water, *Bibliographies), (*Heavy water moderated reactors, Bibliographies), Production.

For abstract, see NSA 28 02, number 02788.

18C. Nuclear Explosions

AD-767 565/5GA PC$6.25/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
GROUND AND WATER SHOCK MEASUREMENT.
Final rept.,
J. D. Day, and D. W. Murrell. 24 Mar 67, 83p VUF-2701
Report on VELA UNIFORM Project Long Shot Project 1.01.

Descriptors: (*Seismological stations, Data processing systems), (*Underground explosions, Detection), (*Seismic waves, Data processing systems), Shock waves, Structural geology, Aleutian Islands, Sea water, Pressure, Instrumentation, Statistical data, Nuclear explosions.
Identifiers: Ground motion, Vela Uniform, Long Shot shot, Amchitka Island, Signal processing.

The report is the final presentation of Vela Uniform Project 1.01 accomplished on the Long Shot test. Primary objectives were: to measure and analyze ground motions in the region above the detonation in light of effectiveness of containment, and to obtain ground-induced water shock measurements at close-in shoreline stations for possible correlation with injury to marine wildlife. A secondary objective was to compare and use (for protective structures purposes) the results of the ground motions with those obtained from other nuclear detonations in rock. These objectives are considered to have been fullfilled to large degree. Excellent ground motion records were obtained, both surface and downhole, and two of the four water stations produced good data. The weapon was successfully contained despite a surface zero transient displacement of 7.3 feet. The ground-induced water pressure at the close-in shoreline station was insufficient to injure marine wildlife. (Modified author abstract)

CEA-R-4128(2)/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Bruyeres-le-Chatel (France). Centre d'Etudes.
DISTRIBUTION OF RADIOACTIVITY IN THE ENVIRONMENT OF A CONTAINED NUCLEAR EXPLOSION. 2. THEORETICAL STUDY: BEHAVIOR OF THE MICROCONSTITUENTS OF THE ENVIRONMENT AND THE NUCLEAR EXPLOSIVE BETWEEN 3000 AND 6000 EXP 0 K AT PRESSURES BETWEEN 1 AND 500 BARS.
F. Balard, J. Covhines, and M. Lutz. May 73, 40p
In French. U.S. Sales Only.

Descriptors: (*Nuclear explosions, *Contained explosions), (*Environment, *Contamination), C codes, Computer calculations, Computer codes, Diffusion, Fission products, Gases, Plutonium, Radioactivity, Thermodynamic properties, Tritium, Ultrahigh temperature, Uranium, Very high pressure.

For abstract, see NSA 28 02, number 02579.

CGS-746-102/GA PC$5.00/MF$1.45
Coast and Geodetic Survey, Rockville, MD.
ALEUTIAN SEISMICITY: MILROW SEISMIC EFFECTS.
E. R. Engdahl, and A. C. Tarr. May 70, 59p

Descriptors: (*Milrow event, *Seismic effects), (*Amchitka island area, *Earthquakes), Seismology.

For abstract, see NSA 28 03, number 05494.

CONF-730327-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
ELECTROMAGNETIC PULSE AND THE ELECTRIC POWER SYSTEM.
J. K. Baird. 4p

Descriptors: (*Electronic equipment, *Physical radiation effects), (*Nuclear explosions, *Electromagnetic radiation), Atmospheric explosions, Pulses, Travelling waves.

For abstract, see NSA 28 03, number 05815.

D-754087/GA PC$5.45/MF$1.45
Rand Corp., Santa Monica, Calif.
EFFECTS OF STRONG EXPLOSIONS. V. (SOVIET LITERATURE TRANSLATIONS). REPORT NO. R-760/4-ARPA.
S. Kassel. Aug 72, 66p
Contract DAHC15-67-C-0141

Descriptors: (*Nuclear explosions, *Seismic effects), Bibliographies, Electromagnetic fields, Exploding wires, Hypersonic flow, Lasers, Particle beams, Seismology, Shock waves, Simulation, Ussr.

For abstract, see NSA 28 03, number 05495.

NVO-746-10/GA PC$13.25/MF$1.45
National Oceanic and Atmospheric Administration, Las Vegas, Nev. Earth Sciences Labs.
SEISMIC DATA REPORT SOUTHERN NEVADA REGION, DECEMBER 22, 1971--DECEMBER 31, 1972.
K. C. Bayer. Feb 73, 221p
Contract AT(29-2)-746

Descriptors: (*Nevada, *Seismology), (*California, Seismology), (*Utah, Seismology), (*Nevada test site, Seismology), Nuclear explosions, Seismic waves, Underground explosions.

For abstract, see NSA 28 02, number 02612.

PNE-RB-41/GA PC$4.00/MF$1.45
Cer Geonuclear Corp., Las Vegas, Nev.
CONDITION SURVEY OF WELLS AND SPRINGS IN THE RIO BLANCO PROJECT AREA, RIO BLANCO COUNTY, N. W. COLORADO.
10 Jan 73, 14p

Descriptors: (*Rio blanco event, *Hydrology), (*Boreholes, *Testing), Chemical composition, Colorado, Drinking water, Electric conductivity, Ground water, Natural gas, Ph value, Production, Seismic effects, Seismology, Surface waters.

For abstract, see NSA 28 03, number 05497.

PNE-RB-42/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL.
K. R. Peterson. 28 Apr 72, 25p PNE-WW-25

Descriptors: (*Wagon wheel event, *Radiation hazards), (*Rio blanco event, Radiation hazards), (*Natural gas, *Production), (*Tritium, *Radiation doses), Contamination, Earth atmosphere, Environment, Iodine 131, Krypton 85, Numerical solution, Radioactivity, Xenon 133.

For abstract, see NSA 28 03, number 05498.

PNE-RB-43/GA PC$5.45/MF$1.45
Cer Geonuclear Corp., Las Vegas, Nev.
PREDETONATION RIO BLANCO HYDROLOGIC TESTING FOR PERIOD FEBRUARY 1, 1973--MAY 1, 1973.
3 May 73, 69p

Descriptors: (*Rio blanco event, *Hydrology), (*Boreholes, *Testing), Boreholes, Colorado, Data, Ground water, Levels, Natural gas, Production, Testing.

For abstract, see NSA 28 03, number 05499.

PNE-WW-24/GA PC$3.25/MF$1.45
Eberline Instrument Corp., Santa Fe, N. Mex. Dept. Of Nuclear Sciences.
ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING AUGUST 1, 1972--OCTOBER 31, 1972.
1972, 22p

Descriptors: (*Plowshare project, *Site selection), (*Wyoming, *Radioactivity), Alpha sources, Beta sources, Drinking water, Earth atmosphere, Environment, Fallout, Gamma sources, Milk, Nuclear explosions, Potassium 40, Radiation monitoring, Sampling, Strontium 90, Surface waters, Tritium, Underground explosions.

For abstract, see NSA 28 03, number 05590.

SC-RR-720547/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PRESSURES IN WATER ON AND NEAR AMCHITKA ISLAND, MILROW, AND CANNIKIN.
M. L. Merritt. Feb 73, 85p

Descriptors: (*Cannikin event, *Seismic effects), (*Milrow event, Seismic effects), (*Amchitka island area, *Coastal waters), Cavitation, Ground motion, Levels, Pressure dependence, Pressure gradients, Seawater, Seismic waves, Seismology, Surface waters.

For abstract, see NSA 28 03, number 05500.

SLA-73-494/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ELECTRON ATTACHMENT AND AVALANCHING ASSOCIATED WITH EMP CALCUATIONS FOR HIGH-ALTITUDE BURSTS.
C. N. Vittitoe. 1972, 26p CONF-730516-1

Descriptors: (*Nuclear explosions, *Electromagnetic radiation), (*Computer codes, *S codes), Atmospheric explosions, Electron attachment, Townsend discharge.

For abstract, see NSA 28 03, number 05501.

TID-26276/GA PC$3.00/MF$1.45
Duke Univ., Durham, N. C. (Usa). School of Engineering.
CRATERING IN LAYERED MEDIA.
A. S. Vesic, N. M. F. Ismael, and K. Bhushan. Aug 71, 45p EERL-TR-E-72-31

Descriptors: (*Cratering explosions, *Sand), (*Sandstones, Cratering explosions), Chemical explosives, Craters, Dimensions, Layers, Mockup, Stratification, Testing, Underground explosions.

For abstract, see NSA 28 03, number 05502.

TID-26311/GA PC$4.25/MF$1.45
Atomic Energy Commission, Washington, D. C.
PROJECT CANNIKIN.
May 71, 42p

Descriptors: (*Cannikin event, *Site selection), (*Amchitka island area, *Ecosystems), Environment, Personnel, Radiation protection, Safety, Seismic effects.

For abstract, see NSA 28 03, number 05504.

UCID-16148/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
APPLICATION OF NUMERICAL MODELING TECHNIQUES TO PROBLEMS IN EXPLOSIVE EXCAVATION ENGINEERING.
D. E. Burton, and J. B. Bryan. Nov 72, 21p CONF-721109-21
Contract W-7405-eng-48

Descriptors: (*Chemical explosions, Excavation), (*Nuclear explosions, Excavation), (*Excavation, *Explosions), Cratering explosions, Finite difference method, Mathematical models.

For abstract, see NSA 28 02, number 02533.

UCID-16243/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PERMEABILITY OF MESAVERDE SANDSTONE SAMPLES: PROJECT RULISON.
R. Quong. 1 Mar 72, 9p
Contract W-7405-eng-48

Descriptors: (*Rulison event, Sandstones), (*Sandstones, *Permeability), Natural gas, Pressure dependence.

For abstract, see NSA 28 02, number 02534.

UCRL-51345/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
NUCLEAR CHEMICAL COPPER MINING AND REFINING: RADIOLOGICAL CONSIDERATIONS.
H. A. Tewes, H. B. Levy, and L. L. Schwartz. 23 Feb 73, 35p
Contract W-7405-Eng-48

Descriptors: (*Nuclear explosions, *Mining), (*Copper, Mining), Contained explosions, Human populations, Radiation doses, Radiation protection, Safety, Underground explosions.

For abstract, see NSA 28 03, number 05530.

UCRL-51349/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
COMPARISON OF SHOCK EFFECTS IN GRANITIC ROCK RECOVERED FROM THE MONIQUE EVENT, ALGERIA, AND THE PILEDRIVER EVENT, NEVADA TEST SITE.
I. Y. Borg. 5 Mar 73, 17p
Contract W-7405-eng-48

Descriptors: (*Granites, *Fracture properties), (*Nuclear explosions, *Seismic effects), Underground explosions, Very high pressure.

For abstract, see NSA 28 02, number 02535.

UCRL-51358/GA PC$6.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SOME OBSERVATIONS RELATED TO MODELING EXPLOSIVE CRATERING PHENOMENA.
J. W. White. 27 Mar 73, 82p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Nuclear excavation), (*Nuclear excavation, *Mathematical models), Computers, Cratering explosions, Dimensions, Openings, Plowshare project, Rocks, Soils, Underground explosions.

For abstract, see NSA 28 03, number 05505.

UCRL-51359/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PREDICTION OF DRY FALLOUT FROM LOW YIELD SURFACE AND UNDERGROUND ATOMIC DEMOLITION MINES.
K. R. Peterson, J. B. Knox, T. A. Jr. Gibson, and L. A. Lawson. 7 Mar 73, 14p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, *Underground explosions), Demolition, Depth, Fallout, Meteorology, Nomograms, Radioactive clouds, Surface explosions, Velocity, Wind.

For abstract, see NSA 28 03, number 05506.

USGS-474-142/GA PC$4.00/MF$1.45
Geological Survey, Lakewood, Colo. (Usa).
HYDRAULIC TESTING AND SAMPLING OF WATER WELL NUMBER 2, PROJECT WAGON WHEEL, SUBLETTE COUNTY, WYOMING.
G. A. Dinwiddie. Apr 73, 37p
Contract AT(29-2)-474

Descriptors: (*Wagon wheel event, Boreholes), (*Boreholes, *Testing), (*Ground water, *Fluid flow), Hydraulics.

For abstract, see NSA 28 02, number 02536.

WASH-1519(Add.)/GA PC$10.75/MF$1.45
Atomic Energy Commission, Washington, D. C.
RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY, COLORADO. ENVIRONMENTAL STATEMENT.
Mar 73, 173p PNE-RB-25

Descriptors: (*Rio blanco event, *Environment), Cost benefit analysis, Disturbances, Gaseous wastes, Natural gas, Nuclear explosions, Production, Radioactive waste disposal, Safety, Stimulation, Underground explosions.

For abstract, see NSA 28 02, number 02615.

WASH-1526/GA PC$8.75/MF$1.45
Atomic Energy Commission, Washington, D. C.
UNDERGROUND NUCLEAR TESTING PROGRAM, NEVADA TEST SITE. ENVIRONMENTAL STATEMENT.
Apr 73, 135p

Descriptors: (*Nevada test site, *Environment), (*Nuclear explosions, *Underground explosions), Nuclear weapons, Radioactivity, Safety, Seismic effects, Seismology.

For abstract, see NSA 28 03, number 05531.

18D. Nuclear Instrumentation

AD-767 044/1GA PC$3.50/MF$1.45
Naval Research Lab Washington D C
DOSIMETRY FOR THE AURORA FACILITY.
Final rept.,
Frank H. Attix. Mar 73, 51p Rept no. NRL-MR-2552-Rev
Revision of report dated Jan 73, AD-756 170.

Descriptors: (*X rays, Measurement), (*Dosimeters, Design), Calcium fluorides, Doping, Manganese, Radiation damage, Thermoluminescence, Semiconductor devices, Silicon, Transients.
Identifiers: *Thermoluminescent dosimetry, Radiation detectors(Semiconductor), Transient radiation effects(Electronics).

A suitable thermoluminescent dosimeter system has been recommended and adopted for routine use at the Aurora Facility: The 0.4-mm x 6-mm, 5% CaF2:Mn in Teflon disc dosimeters, used in conjunction with the Harshaw Model 2000 TLD Reader. A spherical silicon calorimeter has been designed, constructed, tested, and put into service as a dose standard at the Aurora Facility. After operating successfully for dozens of shots, it began showing signs of possible radiation damage about one million rad. Recalibration of the thermistor revealed an 11% increase in resistance over the entire temperature range 15-35C. The calorimeter is back in service, employing the new calibration. Attenuation measurements at the Aurora Facility have indicated that the bremsstrahlung near the rear of the test volume (100 cm from the wall) has an effective energy of about 1.4 MeV. (Author)

ANCR-1103/GA PC$10.60/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
RALPH: AN ONLINE COMPUTER PROGRAM FOR ACQUISITION AND REDUCTION OF PULSE HEIGHT DATA.
R. C. Davies, R. S. Clark, and J. E. Keith. Apr 73, 427p
Contract AT(10-1)-1375

Descriptors: (*Computer codes, R codes), (*R codes, *Gamma spectra), (*Gamma spectrometers, *Data processing), Data acquisition, Solid scintillation detectors.

For abstract, see NSA 28 02, number 02710.

CEA-CONF-2165/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
SUSCEPTABILITY TO PARASITES OF PULSED NUCLEAR MEASUREMENT ENSEMBLES.
J. Buisson. 1973, 14p CONF-730108-2
In French. U.S. Sales Only.

Descriptors: Connectors, Control systems, Eddy currents, Electric cables, Electronic equipment, Shielding.

For abstract, see NSA 28 03, number 05823.

CEA-R-4435/GA PC$3.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
INTERLABORATORY MEASUREMENT OF THE ACTIVITIES OF RADIONUCLIDES EXP 137 CS, EXP 60 CO, EXP 54 MN, EXP 141 CE, AND EXP 57 CO.
J. P. Perolat, J. Legrand, and M. Thenard. May 73, 33p
In French. U.S. Sales Only.

Descriptors: (*Gamma sources, *Calibration), Cerium 141, Cesium 137, Cobalt 57, Cobalt 60, Manganese 54.

For abstract, see NSA 28 02, number 04441.

CERN-Trans-72-18/GA PC$3.00/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Serpukhov. Institut Fiziki Vysokikh Energii.
PROBLEM OF IMPROVING A CRT UNIT WITH HIGH RESOLUTION FOR SCANNING AUTOMATIC UNITS.
B. A. Utochkin, and B. M. Rabin. Sep 72, 14p
Translation by R. Luther of IFVE-SPK--71-92.
U.S. Sales Only.

Descriptors: (*Spark chambers, *Data processing), (*Bubble chambers, Data processing), (*Cathode ray tubes, *Design), Particle tracks, Photographic films.

For abstract, see NSA 28 02, number 02733.

CLOR-92/GA PC$4.25/MF$1.45
Centralne Laboratorium Ochrony Radiologicznej, Warsaw (Poland).
AUTOMATIC METHODS OF CONTINUOUS MEASUREMENT OF EARTH GAMMA BACKGROUND EXPOSURE DOSE.
J. Pensko, J. Jagielak, B. Gwiazdowski, and A. Zak. 1972, 42p
In Polish. U.S. Sales Only.

Descriptors: (*Ionization chambers, *Performance), (*Geiger-mueller counters, Performance), (*Gamma dosimetry, Geiger-mueller counters), Background radiation.

For abstract, see NSA 28 03, number 05721.

CONF-730119-1/GA PC$3.25/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
GAMMA-RAY ENERGIES MEASURED WITH GE(LI) SPECTROMETERS.
R. G. Helmer, R. C. Greenwood, and R. J. Gehrke. 1973, 23p

Descriptors: (*Li-drifted ge detectors, *Accuracy), (*Gamma spectrometers, Accuracy), Corrections, Data processing, Energy resolution, Escape peaks, Mev range 01-10, Performance.

For abstract, see NSA 28 03, number 05730.

COO-3333-3/GA PC$4.50/MF$1.45
Massachusetts General Hospital, Boston. Physics Research Lab.
RECENT DEVELOPMENTS IN POSITRON SCINTIGRAPHY.
G. L. Brownell, and C. A. Burnham. 1972, 49p
Contract A(11-1)-3333

Descriptors: (*Positron cameras, *Operation), Coincidence methods, Counting rates, Data processing, Design, Performance, Readout systems, Shielding.

For abstract, see NSA 28 02, number 02648.

COO-3545-1/GA PC$5.45/MF$1.45
Tyco Labs., Inc., Waltham, Mass.
CADMIUM TELLURIDE DETECTORS. SECOND INTERIM TECHNICAL REPORT, 1 JULY 1971--30 JUNE 1972.
F. Wald, R. O. Bell, and H. B. Serreze. Jul 72, 107p
Contract AT(11-1)-3545

Descriptors: (*Cdte semiconductor detectors, *Performance), (*Gamma detection, Cdte semiconductor detectors), Crystal growth, Fabrication.

For abstract, see NSA 28 03, number 05608.

DESY-73/7/GA PC$3.75/MF$1.45
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
DESCRIPTION AND PERFORMANCE OF AN INTERACTIVE BUBBLE CHAMBER ANALYSIS SYSTEM USING AN HPD.
H. J. Mueck, H. H. Nagel, and F. Selonke. Mar 73, 34p
U.S. Sales Only.

Descriptors: (*Flying spot digitizers, *Performance), (*Bubble chambers, *Data processing), Interactive display devices, Operation, Particle tracks.

For abstract, see NSA 28 02, number 02734.

FEI-351/GA PC$3.50/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
BASIC CHARACTERISTICS OF A DIFFERENTIAL, SINGLE-CRYSTAL SCINTILLATION NEUTRON SPECTROMETER.
L. A. Trykov, and N. D. Tyufyakov. 1972, 27p
In Russian. U.S. Sales Only.

Descriptors: (*Solid scintillation detectors, *Performance), (*Neutron spectrometers, Performance), Heavy ions, Ion detection, Organic compounds.

For abstract, see NSA 28 02, number 02715.

JAPFNR-89/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokai. Tokai Research Establishment.
PERFORMANCE OF HIGH TEMPERATURE NEUTRON DETECTOR.
T. Kawakami, T. Kakuta, and C. Kawaguchi. Dec 71, 49p JAERI-Memo-4665
U.S. Sales Only.

Descriptors: (*Joyo reactor, Neutron detectors), (*Neutron detectors, *Performance testing), High temperature.

For abstract, see NSA 28 03, number 07336.

JEN-246/GA PC$3.00/MF$1.45
Junta de Energia Nuclear, Madrid (Spain). Division de Fisica.
OBTAINING DEPOSITS OF URANIUM FOR MAKING FISSION CHAMBERS.
E. Artacho Saviron. 1972, 12p
In Spanish. U.S. Sales Only.

Descriptors: (*Fission chambers, *Fabrication), (*Uranium, *Electrodeposition).

For abstract, see NSA 28 02, number 02653.

JINR-P8-7025/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
NEW METHOD OF SHIELDING THE CRYOGENIC SURFACES FROM CONTAMINATION BY HARDENED GASES AND ITS APPLICATION AT HYDROGEN BUBBLE CHAMBER WITH DEWAR HEAT INSULATION SYSTEM.
E. I. D'yachkov, and A. G. Zel'dovich. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Cryogenic bubble chambers, *Cryogenics), Hydrogen, Surfaces.

For abstract, see NSA 28 03, number 05782.

K-1841/GA PC$3.00/MF$1.45
Oak Ridge Gaseous Diffusion Plant, Tenn.
COMPUTER CONTROL AND DATA PROCESSING FOR FIFTEEN ISOTOPE RATIO MASS SPECTROMETERS.
C. Sulfridge. 8 May 73, 13p
Contract W-7405-eng-26

Descriptors: (*Mass spectrometers, *Data acquisition systems), Data processing, Isotope ratio, Pdp computers.

For abstract, see NSA 28 03, number 05826.

KHFTI-72-40/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kharkov. Fiziko-Tekhnicheskii Institut.
MULTI-CHANNEL COUNTER FOR THE DETECTION OF HIGH ENERGY ELECTRONS.
V. N. Polishchuk, N. G. Shevchenko, N. G. Afanas'ev, A. Yu. Buki, and Yu. V. Vladimirov. 1972, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Counting circuits, *Design), (*Solid scintillation detectors, Counting circuits), (*Beta spectrometers, Counting circuits), Cherenkov counters, Coincidence circuits, Dead time, Electron detection, Energy resolution, Magnetic spectrometers, Performance.

For abstract, see NSA 28 02, number 02716.

LA-5203-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LOS ALAMOS FIELD PULSE-HEIGHT ANALYZER.
R. D. Hiebert, L. J. Johnson, and A. R. Koelle. Mar 73, 8p
Contract W-7405-eng-36

Descriptors: (*Spectrometers, Multi-channel analyzers), (*Solid scintillation detectors, Multichannel analyzers), (*Multi-channel analyzers, *Design), Calibration, Electronic circuits, Performance, Sodium iodides.

For abstract, see NSA 28 02, number 02717.

LBL-1616/GA PC$4.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
NONDISPERSIVE SOFT X-RAY FLUORESCENCE SPECTROMETER FOR QUANTITATIVE ANALYSIS OF THE MAJOR ELEMENTS IN ROCKS AND MINERALS.
A. J. Hebert, and K. Jr. Street. Apr 73, 26p
Contract W-7405-eng-48

Descriptors: (*X-ray fluorescence analysis, *Li-drifted si detectors), (*Rocks, X-ray fluorescence analysis), (*Minerals, X-ray fluorescence analysis), (*X-ray spectrometers, Li-drifted si detectors).

For abstract, see NSA 28 03, number 05734.

LBL-1719/GA PC$10.50/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
DEVELOPMENT OF A NEUTRON SPECTROMETER USING MULTI-WIRE SPARK CHAMBERS FOR THE MEASUREMENT OF THE SPECTRA OF STRAY NEUTRONS IN THE VICINITY OF HIGH ENERGY ACCELERATORS.
C. B. Lim. Jan 73, 166p
Contract W-7405-eng-48

Descriptors: (*Neutron spectrometers, Radiator counters), (*Wire spark chambers, *Performance), (*Accelerators, *Stray radiation), (*Radiator counters, Wire spark chambers), Polyethylenes, Proton recoil detectors, Spectra unfolding.

For abstract, see NSA 28 03, number 05735.

N-72-32786/GA PC$4.00/MF$1.45
Aeronautical Research Associates of Princeton, Inc., N. J.
PHOTOIONIZATION MEASUREMENT STUDY. FINAL REPORT, 26 FEBRUARY 1971--25 FEBRUARY 1972.
G. Sandri. Feb 72, 41p NASA-CR-130064
Contract NAS5-11402

Descriptors: (*Proportional counters, *Performance), (*X-ray detection, Proportional counters), (*X radiation, *Cosmic radiation), Argon, Ev range 10-100, Ev range 100-1000, Extreme ultraviolet radiation, Gases, Photoionization.

For abstract, see NSA 28 03, number 06545.

N-72-33378/GA PC$5.45/MF$1.45
Massachusetts Inst. Of Tech., Cambridge. Center for Space Research.
PRELIMINARY DESIGN STUDY FOR A COSMIC X-RAY SPECTROMETER. FINAL REPORT.
1 Jul 72, 127p NASA-CR-123910
Contract NAS8-24585

Descriptors: (*X-ray spectrometers, *Design), Crystals, Performance testing, Satellites.

For abstract, see NSA 28 02, number 02718.

N-73-12699/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
COMPARISON OF NEUTRON SPECTRA MEASURED WITH THREE SIZES OF ORGANIC LIQUID SCINTILLATORS USING DIFFERENTIATION ANALYSIS.
D. F. Shook, and C. R. Pierce. Nov 72, 29p NASA-TM-X-2646

Descriptors: (*Neutron spectrometers, *Data processing), (*Liquid scintillation detectors, Data processing), Efficiency, Proton recoil detectors, Spectra unfolding.

For abstract, see NSA 28 02, number 02719.

NP-19722/GA PC$3.00/MF$1.45
Cekmece Nuclear Research and Training Center, Istanbul (Turkey).
CHEMICAL DOSIMETERS IN AQUEOUS SOLUTIONS.
A. Tugsavul, and E. Uenseren. 1972, 17p
U.S. Sales Only.

Descriptors: (*Chemical dosemeters, *Performance), (*Gamma dosimetry, Chemical dosemeters), (*Electron dosimetry, Chemical dosemeters), (*X-ray dosimetry, Chemical dosemeters), Reviews.

For abstract, see NSA 28 03, number 05722.

NP-19749/GA PC$3.25/MF$1.45
Forsvarets Forskningsinstitutt, Kjeller (Norway).
IRRADIATION AND CALIBRATION PLANT AT THE NORWEGIAN AGRICULTURAL COLLEGE.
K. Sand. Mar 73, 22p
In Norwegian. U.S. Sales Only.

Descriptors: (*Irradiation plants, *Design), (*Agriculture, Irradiation plants), Calibration standards, Mutants, Norway, Radiation detectors.

For abstract, see NSA 28 02, number 02796.

N73-27391/4GA PC$3.75/MF$1.45
Maryland Univ., College Park. Dept. of Physics and Astronomy.
SI(LI) POSITION SENSITIVE DETECTOR.
J. R. Gigante. Jan 73, 33p NASA-CR-133408, TR-73-064
Contracts NAS5-11063, NGR-21-002-316

Descriptors: *Lithium, *Particle trajectories, *Radiation detectors, *Surface layers, Coefficients, Detection, Surface reactions.

For abstract, see STAR 1118

N73-28504/1GA PC$4.25/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
DESIGN OF THE ELECTRICAL CIRCUITRY FOR A POSITION SENSITIVE HIGH RESISTANT ANODE WIRE HE3 NEUTRON DETECTOR.
O. Ciftcioglu. May 73, 43p IRI-132-73-02

Descriptors: *Anodes, *Radiation counters, *Radiation detectors, Coupling circuits, Current amplifiers, Electric wire, Equivalent circuits, Geiger counters, Voltage amplifiers.

For abstract, see STAR 1119

ORNL-TM-4118/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
ENERGY DEPOSITION AND ENERGY-DEPOSITION FLUCTUATIONS IN AN IONIZATION SPECTROMETER AND A TOTAL-ABSORPTION NUCLEAR-CASCADE COUNTER.
T. A. Gabriel, and K. C. Chandler. May 73, 30p
Contract W-7405-eng-26

Descriptors: (*Shower counters, *Calibration), (*Protons, *Energy losses), (*Proton detection, Shower counters), Gev range 10-100, Iron, Linear momentum, Plastic scintillation detectors, Gev range 01-10, Pion detection, Pions minus, Sodium iodides, Solid scintillation detectors.

For abstract, see NSA 28 03, number 05783.

ORO-2504-202/GA PC$5.00/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
WIDE-GAP SPARK CHAMBER SYSTEM FOR NAL EXPERIMENT 2-B. TECHNICAL REPORT NO. 73-091.
F. Svrcek, and G. Zorn. Feb 73, 56p

Descriptors: (*Wide gap spark chambers, *Design), Accelerator facilities, Bubble chambers, Cameras, High-voltage pulse generators, Nal synchrotron, Switches, Trigger circuits.

For abstract, see NSA 28 02, number 02736.

ORO-2504-204/GA PC$3.00/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
PREAMPLIFIER FOR MULTI-WIRE PROPORTIONAL COUNTERS. TECHNICAL REPORT NO. 73-097.
L. Trasatti, and G. T. Zorn. Mar 73, 13p

Descriptors: (*Multiwire proportional counters, Preamplifiers), (*Preamplifiers, *Electronic circuits), Design, Readout systems.

For abstract, see NSA 28 02, number 02737.

PAT-APPL-372148/GA PC$3.00/MF$1.45
Wisconsin Univ., Madison.
COAXIAL ANODE WIRE FOR GAS RADIATION COUNTERS.
Patent Application.
W. L. Kraushaar. Filed 21 Jun 73, 17p NASA-CASE-GSC-11492-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Anodes, *Coaxial cables, *Ion charge, *Radiation counters, Background noise, Gas discharge tubes, Squelch circuits, Patent applications.

A coaxial anode for a gas radiation counter is described which suppresses undesirable background ionization interference. The anode is comprised of an elongated central wire covered with an electrically insulating sleeve, and longitudinally discontinuous segments of an electrically conductive coating around the insulating sleeve along the length of the central wire. The conductive segments define a veto or rejection anode at each end of the central wire, and a charge detection anode between the rejection anodes. The charge detecting anode is connected to detection circuitry in anti-coincidence with the rejection anodes. Background radiation detected by either of the rejection anodes and the charge detecting anode is rejected, thereby increasing the sensitivity of the radiation counter.

PATENT-3 688 118/GA Not available NTIS
Department of the Air Force Washington D C
SELECTIVE NEUTRON SENSOR.
Patent,
Eugene F. Martina. Filed 25 Feb 70, patented 29 Aug 72, 4p Rept nos. PAT-APPL-14 123,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Neutron detectors, *Patents), Space environmental conditions, Sensors, Cosmic rays.
Identifiers: PAT-CL-250-83-1.

The patent describes a selective neutron sensor apparatus for selectively detecting a burst of neutrons in a space ionizing radiation environment. It uses two substantially similar detectors. One of the detectors is sensitive to both charged particles and neutrons while the other is sensitive to charged particles only. A differencing circuit receiving the outputs from the two detectors provides an output which represents the true neutron count.

PATENT-3 732 422/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
COUNTER FOR RADIATION MONITORING.
Patent,
Glenn S. Brunson, Robert N. Curran, and Franklin H. Just. Filed 23 May 72, patented 8 May 73, 6p PAT-APPL-256 062
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Radiation counters, *Patents), Timing circuits, Pulse height analyzers.
Identifiers: PAT-CL-250-83-3-R.

The patent concerns a radiation counter which repeatedly takes periodic samples by counting radiation pulses which are received during a predetermined period. The predetermined period is measured by a timing circuit. An amplitude measuring circuit measures the amplitude of the incoming radiation pulses and acts to disable the timing circuit whenever a radiation pulse above a particular amplitude is received. By disabling the timing circuit, dead time, during which the counting circuit will not detect radiation pulses, is not counted as part of the predetermined counting period.

RHEL/R-262/GA PC$6.25/MF$1.45
Rutherford High Energy Lab., Chilton (England).
SURVEY OF POSITION SENSITIVE DETECTORS AND MULTI-COUNTER ARRAYS WITH PARTICULAR REFERENCE TO THERMAL NEUTRON SCATTERING.
B. H. Meardon, and D. C. Salter. Nov 72, 83p
U.S. Sales Only.

Descriptors: (*Position sensitive detectors, *Reviews), (*Neutron detection, Position sensitive detectors), Geiger-mueller counters, Ionization chambers, Neutron beams, Neutron detectors, Proportional counters, Scattering, Scintillation counters, Semiconductor detectors, Spark chambers, Thermal neutrons.

For abstract, see NSA 28 03, number 05784.

SLAC-Trans-137/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
EFFECT OF A MAGNETIC FIELD ON THE EFFICIENCY OF A SPARK CHAMBER.
K. G. Nekrasov. 1971, 11p
Translation of JINR--P13-5811.

Descriptors: (*Spark chambers, *Efficiency), Magnetic fields, Time resolution.

For abstract, see NSA 28 03, number 05785.

SRARI-P-165/GA PC$3.75/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
POTENTIALITIES AND APPLICATION OF THE METHOD OF GAMMA-SPECTROMETRY IN MATERIAL INVESTIGATIONS.
E. F. Davydov, V. B. Ivanov, A. V. Sukhikh, and V. I. Shiplov. 1972, 31p
In Russian. U.S. Sales Only.

Descriptors: (*Gamma spectrometers, *Performance), (*Radioisotopes, *Chemical analysis), Isotopes, Li-drifted ge detectors.

For abstract, see NSA 28 02, number 02720.

TID-26313/GA PC$5.75/MF$1.45
Vanderbilt Univ., Nashville, Tenn.
IODINE-127 FLUORESCENCE STUDIES AND IODINE-125 EMISSION STUDIES BY MEANS OF A LITHIUM-DRIFTED SILICON DETECTOR SYSTEM.
Y. Hwang. Aug 72, 75p

Descriptors: (*Li-drifted si detectors, *Performance), (*Radioisotope scanners, Li-drifted si detectors), Fluorescence, Iodine 125, Iodine 127, Scintiscanning, Sensitivity, Thyroid.

For abstract, see NSA 28 03, number 05609.

UCID-16041/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MEASUREMENTS OF THE ENERGY LOSS PER ION PAIR FOR ELECTRONS STOPPED IN CLOUD CHAMBER ATMOSPHERES.
N. E. Hansen. 2 Mar 73, 11p
Contract W-7405-Eng-48

Descriptors: (*Helium, *Charged-particle transport), (*Methane, Charged-particle transport), (*Nitrogen, Charged-particle transport), (*Air, Charged-particle transport), Argon, Carbon dioxide, Cloud chambers, Electrons, Energy losses, Ion pairs, Low pressure, Medium temperature, Neon.

For abstract, see NSA 28 02, number 04417.

UCRL-51307/GA PC$5.45/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
LLL ELECTRON AND PROTON SPECTROMETER ON NASA'S ORBITING GEOPHYSICAL OBSERVATORY 5 (THE DATA USER'S GUIDE TO THE MICROFILM RECORDS).
H. I. Jr. West. 20 Dec 72, 60p
Contract W-7405-eng-48

Descriptors: (*Ogo satellites, Beta spectrometers), (*Beta spectrometers, *Operation), (*Proton spectrometers, Operation), (*Radiation belts, *Counting rates), Background radiation, Corrections, Flat magnetic spectrometers.

For abstract, see NSA 28 02, number 02721.

UCRL-51360/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
IDENTIFICATION AND MEASUREMENT OF LOW-ENERGY ELECTRONS BY CLOUD CHAMBER TECHNIQUES: THE OXYGEN AND NEON AUGER-ELECTRON PROBLEM.
W. F. Weston. 8 Mar 73, 16p
Contract W-7405-eng-48

Descriptors: (*Photoelectron spectroscopy, *Expansion chambers), (*Oxygen, *Auger effect), (*Neon, Auger effect), Electron detection, Electrons, Ev range 100-1000, Photon collisions.

For abstract, see NSA 28 02, number 02654.

18E. Nuclear Power Plants

AECL-4357/GA PC$3.75/MF$1.45
Atomic Energy of Canada LTD., Sheridan Park (Ontario).
RECENT PROGRESS WITH CANADA'S NUCLEAR GENERATING STATIONS.
K. L. Smith. Jan 73, 31p CONF-720988-1
U.S. Sales Only.

Descriptors: (*Pickering-1 reactor, *Performance), (*Pickering-2 reactor, Performance), (*Pickering-3 reactor, Performance), (*Gentilly reactor, Performance), Bruce-1 reactor, Canada, Candu reactor, Kanupp reactor, Npd reactor, Pickering-4 reactor, Planning, Rajasthan-1 reactor, Rajasthan-2 reactor.

For abstract, see NSA 28 02, number 04516.

CEA-Bib-207/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
OFFSHORE NUCLEAR POWER PLANTS.
C. M. Cotton. May 73, 20p
In French. U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Bibliographies), Reactor sites, Seas.

For abstract, see NSA 28 02, number 04579.

CENPD-83(Rev.1)/GA PC$9.75/MF$1.45
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.
DESCRIPTION OF METHODOLOGY FOR DEVELOPING MASS/ENERGY RELEASE DATA FOR CONTAINMENT DESIGN.
Apr 73, 154p

Descriptors: (*Pwr type reactors, Containment buildings), (*Containment buildings, *Design), Analytical solution, Blowdown, Energy, Loss of coolant, Pressure dependence, Reactor accidents, Size, W codes.

For abstract, see NSA 28 03, number 07419.

DLC8-5000472/GA PC$3.25/MF$1.45
Duquesne Light CO., Shippingport, PA.
SHIPPINGPORT ATOMIC POWER STATION. QUARTERLY OPERATING REPORT, FOURTH QUARTER 1972.
1972, 24p
Contract AT(11-1)-292

Descriptors: (*Shippingport reactor, *Reactor maintenance), Leaks, Radioactive waste disposal, Reactor operation, Reactor shutdown, Reactor start-up, Solid wastes, Valves, Water.

For abstract, see NSA 28 03, number 07272.

DOCKET-50003-166/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
INDIAN POINT STATION, UNITS 1 AND 2. FINDINGS OF SECURITY MEASURES.
18 Apr 73, 2p DOCKET-50247-100

Descriptors: (*Indian point-1 reactor, *Security), (*Indian point-2 reactor, Security), Reactor licensing.

For abstract, see NSA 28 02, number 04669.

DOCKET-50003-167/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
INDIAN POINT STATION, UNITS 1, 2, AND 3. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 5p DOCKET-50247-101, DOCKET-50286-79

Descriptors: (*Indian point-1 reactor, *Equipment protection devices), (*Indian point-2 reactor, Equipment protection devices), (*Indian point-3 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04670.

DOCKET-50003-168/GA PC$3.25/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT STATION, UNIT 1. ACTION TAKEN TO CORRECT THE ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION ON NOVEMBER 28--29, 1972.
2 Mar 73, 22p

Descriptors: (*Indian point-1 reactor, *Radiation protection), Quality assurance, Reactor licensing.

For abstract, see NSA 28 02, number 04671.

DOCKET-50003-169/GA PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT STATION, UNIT 1. ENDORSEMENT TO NELIA POLICY NO. NF-100.
10 Apr 73, 2p

Descriptors: (*Indian point-1 reactor, *Nuclear insurance), Liabilities, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04672.

DOCKET-50003-170/GA PC$3.00/MF$1.45
New York State Dept. Of Environmental Conservation, Albany, N.Y.
INDIAN POINT STATION, UNITS 1 AND 2. CERTIFICATION THAT THERE IS NO APPLICABLE EFFLUENT LIMITATION BY NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
24 Apr 73, 4p DOCKET-50247-103

Descriptors: (*Indian point-1 reactor, *Environment), (*Indian point-2 reactor, Environment), Reactor licensing, Reactor operation, Waste heat.

For abstract, see NSA 28 02, number 04673.

DOCKET-50003-171/GA PC$3.25/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT STATION, UNIT 1. ACTION TAKEN TO CORRECT VIOLATIONS BROUGHT TO ATTENTION FOLLOWING INSPECTION ON FEBRUARY 14--15, 1973.
29 Mar 73, 21p

Descriptors: (*Indian point-1 reactor, *Valves), Containment systems, Failures, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04674.

DOCKET-50003-172/GA PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT STATION, UNIT 1. INDEMNITY AGREEMENT NO. B-19, MAELU POLICY NO. MF-29, ENDORSEMENT NO. 56; NELIA POLICY NO. NF-100, ENDORSEMENT NO. 67.
25 Apr 73, 4p

Descriptors: (*Indian point-1 reactor, *Nuclear insurance), Liabilities, Reactor licensing.

For abstract, see NSA 28 02, number 04675.

DOCKET-50010-151/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 1. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION OF FEBRUARY 7, 8, 9, AND 16, 1973.
4 Apr 73, 13p

Descriptors: (*Dresden-1 reactor, *Stack disposal), Gaseous wastes, Radioactive wastes, Reactor licensing.

For abstract, see NSA 28 02, number 04676.

DOCKET-50010-152/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 1. EFFECTIVENESS OF EMERGENCY CONDENSER IN TERMINATING A TRANSIENT WAS REDUCED.
24 Apr 73, 2p

Descriptors: (*Dresden-1 reactor, *Steam condensers), Eccs, Failures, Reactor licensing, Valves.

For abstract, see NSA 28 02, number 04677.

DOCKET-50010-153/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 1. ENDORSEMENTS NOS. 71 AND 72 FOR MAELU POLICY NO. MF-22.
24 Apr 73, 3p

Descriptors: (*Dresden-1 reactor, *Nuclear insurance), Liabilities, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04678.

DOCKET-50010-154/GA PC$3.75/MF$1.45
Gulf United Nuclear Fuels Corp., Elmsford, N.Y.
DRESDEN NUCLEAR POWER STATION, UNIT 1. FUEL DENSIFICATION, NONPROPRIETARY REPORT, GU--5296.
18 Apr 73, 35p

Descriptors: (*Dresden-1 reactor, *Fuel densification), Reactor licensing, Reactor safety.

For abstract, see NSA 28 02, number 04679.

DOCKET-50010-155/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNITS 1, 2, AND 3. QUAD-CITIES STATION, UNITS 1 AND 2. VALVE WALL THICKNESS.
15 Feb 73, 3p DOCKET-50237-325, DOCKET-50249-218

Descriptors: (*Dresden-1 reactor, *Valves), (*Dresden-2 reactor, Valves), (*Dresden-3 reactor, Valves), (*Quad cities-1 reactor, Valves), Quad cities-2 reactor, Reactor licensing, Thickness.

For abstract, see NSA 28 03, number 07528.

DOCKET-50010-156/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 1. PROPOSED CHANGE TO APPENDIX A TO PERMIT OPERATION OF CYCLE 9, SUPPLEMENT A.
4 May 73, 2p

Descriptors: (*Dresden-1 reactor, *Fuel rods), Anodization, Fuel cans, Performance, Reactor licensing, Zircaloy-2.

For abstract, see NSA 28 03, number 07529.

DOCKET-50010-157/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 1. CLARIFICATION OF LETTER DATED OCTOBER 27, 1972 CONCERNING CONTROL VALVE FAILURE.
9 May 73, 2p

Descriptors: (*Dresden-1 reactor, *Valves), Control systems, Failures, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07530.

DOCKET-50016-191/GA PC$3.00/MF$1.45
Power Reactor Development CO., Detroit, Mich.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 1. ENDORSEMENTS NOS. 67, 68, 69, 70, AND 71 TO NELIA POLICY NO. NF-92.
16 Apr 73, 8p

Descriptors: (*Enrico fermi-1 reactor, *Nuclear insurance), Legal aspects, Liabilities, Reactor accidents, Reactor licensing.

For abstract, see NSA 28 02, number 04680.

DOCKET-50016-192/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE 37.
25 Apr 73, 2p

Descriptors: (*Enrico fermi-1 reactor, *Reactor dismantling), Reactor licensing, Sodium, Specifications.

For abstract, see NSA 28 02, number 04681.

DOCKET-50016-193/GA PC$3.00/MF$1.45
Power Reactor Development CO., Detroit, Mich.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, REQUEST FOR AUTHORIZATION OF A CHANGE.
4 May 73, 9p

Descriptors: (*Enrico fermi-1 reactor, *Containment buildings), Reactor licensing, Reactor maintenance, Specifications, Testing.

For abstract, see NSA 28 02, number 04682.

DOCKET-50018-24/GA PC$3.00/MF$1.45
General Electric CO., Pleasanton, Calif. Vallecitos Nuclear Center.
VALLECITOS BOILING WATER REACTOR. ANNUAL REPORT NO. 8, 1972.
11 Apr 73, 4p

Descriptors: (*Vbwr reactor, *Radiation monitoring), Inspection, Reactor licensing.

For abstract, see NSA 28 02, number 04683.

DOCKET-50029-239/GA PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass.
YANKEE NUCLEAR POWER STATION. OVERLAY APPLIED TO EXTERIOR SURFACES OF VALVES.
19 Mar 73, 2p

Descriptors: (*Rowe yankee reactor, *Valves), Reactor licensing, Welded joints.

For abstract, see NSA 28 02, number 04684.

DOCKET-50029-240/GA PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass.
YANKEE NUCLEAR POWER STATION. IN-CORE THERMOCOUPLE DIFFICULTY.
24 Apr 73, 2p

Descriptors: (*Rowe yankee reactor, *In core instruments), Performance, Reactor licensing, Reactor operation, Thermocouples.

For abstract, see NSA 28 02, number 04685.

DOCKET-50029-241/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
YANKEE NUCLEAR POWER STATION. INSPECTION REPORT NO. 50-29/73-01.
16 Mar 73, 5p

Descriptors: (*Rowe yankee reactor, *Inspection), Quality assurance, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04686.

DOCKET-50029-242/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
YANKEE NUCLEAR POWER STATION. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 5p

Descriptors: (*Rowe yankee reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04687.

DOCKET-50029-243/GA PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass.
YANKEE NUCLEAR POWER STATION. CONTROL ROD SURVEILLANCE TESTING.
24 Apr 73, 3p

Descriptors: (*Rowe yankee reactor, *Control elements), Inspection, Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 02, number 04689.

DOCKET-50029-244/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
YANKEE NUCLEAR POWER STATION. REQUEST ADDITIONAL INFORMATION ON FUEL DENSIFICATION.
27 Apr 73, 1p

Descriptors: (*Rowe yankee reactor, *Fuel densification), Heat transfer, Mathematical models, Reactor licensing.

For abstract, see NSA 28 02, number 04688.

DOCKET-50029-245/GA PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass.
YANKEE NUCLEAR POWER STATION. SCHEDULE FOR PREPARATION AND SUBMITTAL OF NEW FINAL SAFETY ANALYSIS REPORT.
24 Apr 73, 1p

Descriptors: (*Rowe yankee reactor, *Reactor licensing), Legal aspects.

For abstract, see NSA 28 02, number 04690.

DOCKET-50029-247/GA PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass.
YANKEE NUCLEAR POWER STATION. CONTROL ROD SURVEILLANCE TESTING DATA OBTAINED ON MAY 4, 1973.
7 May 73, 2p

Descriptors: (*Rowe yankee reactor, *Control elements), Performance testing, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07531.

DOCKET-50029-248/GA PC$3.00/MF$1.45
Yankee Atomic Electric CO., Rowe, Mass.
YANKEE NUCLEAR POWER STATION. FAILURE IN AUTOMATIC CONTROL DUE TO LEAKAGE IN PRESSURE SENSING LINE.
14 May 73, 2p

Descriptors: (*Rowe yankee reactor, *Turbines), Equipment protection devices, Failures, Reactor licensing, Reactor shutdown, Reactor start-up, Scram, Switches.

For abstract, see NSA 28 03, number 07532.

DOCKET-50029-249/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
YANKEE NUCLEAR POWER STATION. OPERATING REACTOR AT POWER WITHOUT REQUIRED PROTECTIVE TRIPS.
15 May 73, 3p

Descriptors: (*Rowe yankee reactor, *Reactor start-up), Equipment protection devices, Pressure dependence, Reactor licensing, Reactor operation, Scram, Switches.

For abstract, see NSA 28 03, number 07533.

DOCKET-50133-118/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
HUMBOLDT BAY POWER PLANT, UNIT 3. EFFICIENCY OF FULL FACEPIECE RESPIRATORS.
25 Apr 73, 2p

Descriptors: (*Humboldt bay reactor, *Respirators), Aerosols, Performance, Personnel, Radiation protection, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04691.

DOCKET-50155-149/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. REINSTALLED 4 ASSEMBLIES.
10 Apr 73, 1p

Descriptors: (*Big rock point reactor, *Fuel assemblies), Configuration, Reactor cores, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04692.

DOCKET-50155-150/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
BIG ROCK POINT NUCLEAR PLANT. TECHNICAL SPECIFICATIONS, CHANGE 36.
11 Apr 73, 4p

Descriptors: (*Big rock point reactor, *Steam condensers), Reactor licensing, Reactor operation, Specifications.

For abstract, see NSA 28 02, number 04693.

DOCKET-50155-151/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
BIG ROCK POINT NUCLEAR PLANT. TECHNICAL SPECIFICATIONS, CHANGE 37.
25 Apr 73, 18p

Descriptors: (*Big rock point reactor, *Radiation protection), Reactor licensing, Reactor operation, Respirators, Specifications.

For abstract, see NSA 28 02, number 04694.

DOCKET-50155-152/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. MISSING LOWER ROLLERS.
1 May 73, 2p

Descriptors: (*Big rock point reactor, *Control elements), Bearings, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04695.

DOCKET-50155-153/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. RADIATION SURVEY.
2 May 73, 1p

Descriptors: (*Big rock point reactor, *Radiation monitoring), Environment, Radiation protection, Reactor licensing, Reactor operation, Reactor sites.

For abstract, see NSA 28 02, number 04696.

DOCKET-50155-154/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. OFF-GAS HOLDUP TIME.
2 May 73, 2p

Descriptors: (*Big rock point reactor, *Gaseous wastes), Radioactive wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04697.

DOCKET-50155-155/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. PALISADES PLANT. CIRCUIT BREAKERS IN SAFETY RELATED EQUIPMENT.
6 Apr 73, 1p DOCKET-50255-155

Descriptors: (*Big rock point reactor, *Circuit breakers), (*Palisades-1 reactor, Circuit breakers), Equipment protection devices, Reactor licensing.

For abstract, see NSA 28 03, number 07534.

DOCKET-50171-119/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 1, 2, AND 3. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 3p DOCKET-50277-88, DOCKET-50278-83

Descriptors: (*Peach bottom-1 reactor, *Equipment protection devices), (*Peach bottom-2 reactor, Equipment protection devices), (*Peach bottom-3 reactor, Equipment protection devices), Circuit breakers, Reactor licensing.

For abstract, see NSA 28 02, number 04698.

DOCKET-50171-120/GA PC$3.00/MF$1.45
Philadelphia Electric CO., PA.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 1. INVESTIGATION OF THE SLOW SCRAM TIME OF THE 3C CONTROL ROD.
24 Apr 73, 2p

Descriptors: (*Peach bottom-1 reactor, *Control elements), Control rod drives, Performance testing, Reactor control systems, Reactor licensing, Scram.

For abstract, see NSA 28 02, number 04699.

DOCKET-50171-121/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 1. ORDER EXTENDING PROVISIONAL OPERATING LICENSE EXPIRATION DATE TO JUNE 24, 1974.
9 Apr 73, 6p

Descriptors: Peach bottom-1 reactor, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04700.

DOCKET-50171-122/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE 16, EFFICIENCY OF FULL FACEPIECE RESPIRATORS.
25 Apr 73, 2p

Descriptors: (*Peach bottom-1 reactor, *Respirators), Aerosols, Personnel, Radiation protection, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04701.

DOCKET-50206-196/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE 8.
3 Apr 73, 4p

Descriptors: (*San onofre-1 reactor, *Fuel cycle), Burnup, Fuel assemblies, Reactor cores, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04702.

DOCKET-50206-197/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. SCHEDULE FOR REVIEW OF APPLICATION FOR FULL-TERM OPERATING LICENSE.
4 Apr 73, 4p

Descriptors: (*San onofre-1 reactor, *Reactor licensing), Environment, Reactor operation, Reactor safety.

For abstract, see NSA 28 02, number 04703.

DOCKET-50206-198/GA PC$3.00/MF$1.45
Southern California Edison CO., Rosemead, Calif.
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. PLANS FOR REFUELING.
26 Apr 73, 5p

Descriptors: (*San onofre-1 reactor, *Fuel shuffling), Contracts, Personnel, Planning, Reactor fueling, Reactor licensing.

For abstract, see NSA 28 02, number 04704.

DOCKET-50206-199/GA PC$5.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA.
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. SUMMARY ANALYSIS OF THE APRIL 30 INCIDENT.
Apr 73, 63p WCAP-8099

Descriptors: (*San onofre-1 reactor, *Pressure vessels), Reactor licensing, Reactor operation, Thermal stresses, Transients.

For abstract, see NSA 28 02, number 04705.

DOCKET-50206-200/GA PC$13.75/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. DRAFT ENVIRONMENTAL STATEMENT.
May 73, 235p

Descriptors: (*San onofre-1 reactor, *Environment), Cost benefit analysis, Geology, Radioactive wastes, Reactor licensing, Reactor operation, Reactor sites, Thermal effluents.

For abstract, see NSA 28 03, number 07535.

DOCKET-50213-187/GA PC$4.75/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
HADDAM NECK PLANT, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 53p

Descriptors: (*Connecticut yankee reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04706.

DOCKET-50213-188/GA PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., East Hampton (Usa).
HADDAM NECK PLANT, UNIT 1. ACTION TAKEN TO CORRECT VIOLATION BROUGHT TO ATTENTION FOLLOWING INSPECTION, FEBRUARY 5--9, 1973.
20 Mar 73, 20p

Descriptors: (*Connecticut yankee reactor, *Air filters), Containment systems, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04707.

DOCKET-50213-189/GA PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., Hartford.
HADDAM NECK PLANT, UNIT 1. FUEL DENSIFICATION EFFECTS.
27 Apr 73, 20p

Descriptors: (*Connecticut yankee reactor, *Fuel densification), Reactor licensing, Reactor operation, Specifications.

For abstract, see NSA 28 02, number 04708.

DOCKET-50213-190/GA PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., East Hampton (Usa).
HADDAM NECK PLANT, UNIT 1. OPERATION REPORT NO. 73-3 FOR MONTH OF MARCH 1973.
25 Apr 73, 14p NYO-3144-82

Descriptors: (*Connecticut yankee reactor, *Reactor maintenance), Radioactive wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04709.

DOCKET-50213-191/GA PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., Hartford.
HADDAM NECK PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, PROPOSED CHANGE 23.
26 Apr 73, 12p

Descriptors: (*Connecticut yankee reactor, *Pressure vessels), Primary coolant circuits, Reactor licensing, Reactor operation, Specifications, Thermodynamics.

For abstract, see NSA 28 02, number 04710.

DOCKET-50219-250/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 4p

Descriptors: (*Oyster creek-1 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04711.

DOCKET-50219-251/GA PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N. J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ISOLATION CONDENSER VALVE FAILURE.
24 Apr 73, 2p

Descriptors: (*Oyster creek-1 reactor, *Valves), Equipment protection devices, Failures, Reactor licensing, Steam condensers.

For abstract, see NSA 28 02, number 04712.

DOCKET-50219-252/GA PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N. J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ELECTROMATIC RELIEF VALVE FAILURE.
24 Apr 73, 2p

Descriptors: (*Oyster creek-1 reactor, *Valves), Failures, Reactor licensing, Reactor safety.

For abstract, see NSA 28 02, number 04713.

DOCKET-50219-253/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE 13.
24 Apr 73, 3p

Descriptors: (*Oyster creek-1 reactor, *Reactor fueling), Reactor licensing, Remote handling, Specifications, Switches.

For abstract, see NSA 28 02, number 04714.

DOCKET-50219-254/GA PC$3.50/MF$1.45
Jersey Central Power and Light CO., Morristown, N. J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ACTION TO BE TAKEN TO CORRECT ITEMS OF VIOLATION BROUGHT TO ATTENTION FOLLOWING INSPECTION ON MARCH 13, 1973.
28 Mar 73, 27p

Descriptors: (*Oyster creek-1 reactor, *Radiation protection), Personnel, Reactor operation, Reactor safety.

For abstract, see NSA 28 02, number 04715.

DOCKET-50219-255/GA PC$4.25/MF$1.45
Jersey Central Power and Light CO., Morristown, N. J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ACTION TAKEN TO CORRECT VIOLATIONS BROUGHT TO ATTENTION FOLLOWING INSPECTION ON NOVEMBER 9, 10, 12, 13, 17, 20 AND DECEMBER 7 AND 8, 1972.
27 Mar 73, 44p

Descriptors: (*Oyster creek-1 reactor, *Radiation protection), Radioactive wastes, Reactor licensing, Reactor operation, Waste storage.

For abstract, see NSA 28 02, number 04716.

DOCKET-50219-256/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. INQUIRY REPORT NO. 50-219/73-06Q, DRAIN VALVE OPEN ON CHROMATED WATER TANK TRUCK.
30 Apr 73, 2p

Descriptors: (*Oyster creek-1 reactor, *Radioactive wastes), Radiation accidents, Reactor licensing, Reactor sites, Waste storage.

For abstract, see NSA 28 02, number 04717.

DOCKET-50219-257/GA PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. APPLICATION FOR A FULL TERM LICENSE, SUPPLEMENT 5.
2 May 73, 7p

Descriptors: (*Oyster creek-1 reactor, *Fuel assemblies), Containers, Reactor licensing, Reactor safety, Spent fuel storage, Transport.

For abstract, see NSA 28 02, number 04718.

DOCKET-50219-259/GA PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. REQUEST FOR AUTHORIZATION TO CONDUCT LOW POWER PHYSICS TESTS.
15 May 73, 1p

Descriptors: (*Oyster creek-1 reactor, *Reactor operation), Power, Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07536.

DOCKET-50220-135/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
NINE MILE POINT NUCLEAR STATION, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 4p

Descriptors: (*Nine mile point-1 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04719.

DOCKET-50220-136/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
NINE MILE POINT NUCLEAR STATION, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE 7.
18 Apr 73, 4p

Descriptors: (*Nine mile point-1 reactor, *Reactor maintenance), Containment, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04720.

DOCKET-50237-321/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 2. SPECIAL REPORT NO. 22, STARTUP TEST REPORT, SUPPLEMENT A.
17 Apr 73, 2p

Descriptors: (*Dresden-2 reactor, *Testing), Mechanical vibrations, Reactor licensing, Reactor start-up.

For abstract, see NSA 28 02, number 04721.

DOCKET-50237-322/GA PC$3.50/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3. SPECIAL REPORT NO. 23, DRYWELL TO TORUS VACUUM BREAKERS.
Apr 73, 30p DOCKET-50249-216

Descriptors: (*Dresden-2 reactor, *Containment), (*Dresden-3 reactor, Containment), Performance, Reactor licensing, Valves.

For abstract, see NSA 28 02, number 04722.

DOCKET-50237-323/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3. SECONDARY CONTAINMENT INTEGRITY NOT IN EFFECT.
27 Apr 73, 2p DOCKET-50249-217

Descriptors: (*Dresden-2 reactor, *Containment), (*Dresden-3 reactor, Containment), Bypasses, Equipment protection devices, Inspection, Maintenance, Reactor licensing, Specifications, Steam, Turbines, Valves.

For abstract, see NSA 28 02, number 04723.

DOCKET-50237-324/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 2. SPECIAL REPORT NO. 24, RESPONSE OF DRESDEN UNIT 2 TO TRANSIENT TESTS WITHOUT THE FLOW BIASED SCRAM CIRCUIT.
27 Apr 73, 5p

Descriptors: (*Dresden-2 reactor, *Transients), Reactor licensing, Reactor operation, Scram, Testing.

For abstract, see NSA 28 02, number 04724.

DOCKET-50237-326/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
DRESDEN NUCLEAR POWER STATION, UNIT 2. INSPECTION REPORT 050-237/73-02.
27 Apr 73, 9p

Descriptors: (*Dresden-2 reactor, *Inspection), Explosions, Hydrogen, Radioactive wastes, Reactor licensing.

For abstract, see NSA 28 03, number 07537.

DOCKET-50244-153/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 5p

Descriptors: (*Ginna-1 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04725.

DOCKET-50244-154/GA PC$5.00/MF$1.45
Rochester Gas and Electric Corp., N. Y.
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. ANALYSIS OF CAPSULE V FROM THE REACTOR VESSEL SURVEILLANCE PROGRAM.
1 Apr 73, 59p

Descriptors: (*Ginna-1 reactor, *Pressure vessels), Fast neutrons, Physical radiation effects, Reactor licensing, Steels, Testing.

For abstract, see NSA 28 02, number 04726.

DOCKET-50245-213/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
MILLSTONE NUCLEAR POWER STATION, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 4p DOCKET-50336-53

Descriptors: (*Millstone-1 reactor, *Equipment protection devices), (*Millstone-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04727.

DOCKET-50245-214/GA PC$3.00/MF$1.45
Federal Power Commission, Washington, D.C. Bureau of Power.
MILLSTONE NUCLEAR POWER STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF THE FEDERAL POWER COMMISSION.
25 Apr 73, 8p DOCKET-50336-54

Descriptors: (*Millstone-1 reactor, *Environment), (*Millstone-2 reactor, Environment), Economics, Electric power, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04728.

DOCKET-50245-215/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. INSPECTION REPORT NO. 50-245/73-04.
27 Mar 73, 17p

Descriptors: (*Millstone-1 reactor, *Inspection), Control elements, Reactor licensing.

For abstract, see NSA 28 02, number 04729.

DOCKET-50245-216/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. INSPECTION REPORT NO. 50-245/73-07.
29 Mar 73, 7p

Descriptors: (*Millstone-1 reactor, *Inspection), Containment shells, Leak testing, Reactor licensing.

For abstract, see NSA 28 02, number 04730.

DOCKET-50245-217/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. ACTION TAKEN TO CORRECT VIOLATION BROUGHT TO ATTENTION FOLLOWING INSPECTION ON JANUARY 8--10, 1973.
15 Mar 73, 20p

Descriptors: (*Millstone-1 reactor, *Control rod drives), Failures, Reactor licensing, Reactor operation, Surface coating.

For abstract, see NSA 28 02, number 04731.

DOCKET-50245-218/GA PC$7.00/MF$1.45
Teledyne Materials Research CO., Waltham, Mass.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. INVESTIGATION OF A PIPING SUPPORT FAILURE ON THE LPCI CROSSOVER LINE.
23 Jan 73, 100p

Descriptors: (*Millstone-1 reactor, *Pipes), Eccs, Failures, Reactor accidents, Supports.

For abstract, see NSA 28 02, number 04732.

DOCKET-50245-219/GA PC$3.00/MF$1.45
Department of the Interior, Washington, D.C. (Usa).
MILLSTONE NUCLEAR POWER STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF UNITED STATES DEPARTMENT OF THE INTERIOR.
23 Apr 73, 6p DOCKET-50336-56

Descriptors: (*Millstone-1 reactor, *Environment), (*Millstone-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04733.

DOCKET-50247-102/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
INDIAN POINT NUCLEAR GENERATING UNIT 2. INSPECTION REPORT NO. 50-247/73-05, VALVE WALL THICKNESS.
23 Mar 73, 11p

Descriptors: (*Indian point-2 reactor, *Inspection), Reactor licensing, Specifications, Thickness, Valves.

For abstract, see NSA 28 02, number 04734.

DOCKET-50247-104/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
INDIAN POINT NUCLEAR GENERATING UNIT 2. INSPECTION REPORT NO. 50-247/73-04.
29 Mar 73, 18p

Descriptors: (*Indian point-2 reactor, *Inspection), Quality control, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04735.

DOCKET-50247-105/GA PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 2. BOTH DOORS OF 80' ELEVATION PERSONNEL AIR LOCK WERE INADVERTENTLY PLACED IN THE OPEN POSITION.
27 Apr 73, 2p

Descriptors: (*Indian point-2 reactor, *Doors), Containment buildings, Failures, Reactor licensing.

For abstract, see NSA 28 02, number 04736.

DOCKET-50247-106/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
INDIAN POINT NUCLEAR GENERATING UNIT 2. FACILITY OPERATING LICENSE NO. DPR-26, AMENDMENT 2.
27 Apr 73, 9p

Descriptors: (*Indian point-2 reactor, *Reactor operation), Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04737.

DOCKET-50247-107/GA PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 2. NUMBER 22 MAIN STEAM ISOLATION VALVE FAILED TO CLOSE.
4 May 73, 3p

Descriptors: (*Indian point-2 reactor, *Valves), Failures, Pipelines, Reactor licensing, Reactor operation, Steam.

For abstract, see NSA 28 02, number 04738.

DOCKET-50247-108/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
INDIAN POINT NUCLEAR GENERATING UNIT 2. INSPECTION REPORT NO. 50-247/73-08.
17 Apr 73, 7p

Descriptors: (*Indian point-2 reactor, *Inspection), Management, Personnel, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07538.

DOCKET-50249-207/GA PC$3.00/MF$1.45
Illinois Environmental Protection Agency, Springfield (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 3. NO APPLICABLE EFFLUENT LIMITATION, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.
30 Mar 73, 2p

Descriptors: (*Dresden-3 reactor, *Environment), Radioactive wastes, Reactor licensing, Reactor operation, Waste heat.

For abstract, see NSA 28 02, number 04739.

DOCKET-50249-214/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
DRESDEN NUCLEAR POWER STATION, UNIT 3. APPROXIMATELY 28 RELOAD 1 FUEL BUNDLES WILL REPLACE AN EQUAL NUMBER OF INITIAL FUEL BUNDLES.
11 Apr 73, 4p

Descriptors: (*Dresden-3 reactor, *Fuel assemblies), Configuration, Reactor cores, Reactor licensing, Reactor operation, Specifications.

For abstract, see NSA 28 02, number 04740.

DOCKET-50249-215/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 3. TWO OF FOUR SUSTAINED HIGH REACTOR PRESSURE SWITCHES OUT OF CALIBRATION.
19 Apr 73, 4p

Descriptors: (*Dresden-3 reactor, *Equipment protection devices), Calibration, Medium pressure, Reactor licensing, Switches, Testing.

For abstract, see NSA 28 02, number 04741.

DOCKET-50249-221/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 3. PROPOSED MODIFICATION 73-2, SUPPLEMENT A.
1 May 73, 3p

Descriptors: (*Dresden-3 reactor, *Reactor fueling), Fuel shuffling, Reactivity, Reactor licensing, Scram.

For abstract, see NSA 28 03, number 07539.

DOCKET-50249-223/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 3. MOTOR OPERATED VALVE 3-1501-22B STOPPED IN MID POSITION.
4 May 73, 2p

Descriptors: (*Dresden-3 reactor, *Valves), Eccs, Failures, Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07540.

DOCKET-50250-122/GA PC$3.00/MF$1.45
Florida Dept. Of Pollution Control, Tallahassee (Usa).
TURKEY POINT PLANT, UNITS 3 AND 4. CONFIRMATION THAT CONSTRUCTION AND OPERATION OF PLANT WILL NOT VIOLATE APPLICABLE WATER QUALITY STANDARDS, STATE OF FLORIDA DEPARTMENT OF POLLUTION CONTROL.
5 Apr 73, 2p DOCKET-50251-102

Descriptors: (*Turkey point-3 reactor, *Environment), (*Turkey point-4 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04742.

DOCKET-50250-128/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
TURKEY POINT PLANT, UNIT 3. REACTOR COOLANT LOOP BYPASS FLOW TRANSMITTER LEAK.
20 Apr 73, 5p

Descriptors: (*Turkey point-3 reactor, *Reactor cooling systems), Bypasses, Leaks, Reactor licensing.

For abstract, see NSA 28 03, number 07541.

DOCKET-50254-183/GA PC$3.00/MF$1.45
Illinois Environmental Protection Agency, Springfield (Usa).
QUAD-CITIES STATION, UNITS 1 AND 2. NO APPLICABLE EFFLUENT LIMITATION, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.
30 Mar 73, 2p DOCKET-50265-173

Descriptors: (*Quad cities-1 reactor, *Environment), (*Quad cities-2 reactor, Environment), Radioactive wastes, Reactor licensing, Reactor operation, Waste heat.

For abstract, see NSA 28 02, number 04743.

DOCKET-50254-189/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Cordova, Ill.
QUAD CITIES STATION, UNIT 1. COOLANT CONDUCTIVITY LIMIT EXCEEDED APRIL 6, 1973.
18 Apr 73, 2p

Descriptors: (*Quad cities-1 reactor, *Coolants), Electric conductivity, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04744.

DOCKET-50254-190/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Cordova, Ill.
QUAD-CITIES STATION, UNIT 1. THREE SWITCHES OUT OF CALIBRATION.
30 Apr 73, 2p

Descriptors: (*Quad cities-1 reactor, *Equipment protection devices), Calibration, Reactor licensing, Reactor operation, Scram, Switches.

For abstract, see NSA 28 02, number 04745.

DOCKET-50254-191/GA PC$10.75/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
QUAD-CITIES STATION, UNITS 1 AND 2. STARTUP TEST RESULTS.
Mar 73, 175p DOCKET-50265-180, NEDC-10810

Descriptors: (*Quad cities-1 reactor, *Reactor start-up), (*Quad cities-2 reactor, Reactor start-up), Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04746.

DOCKET-50254-192/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.

QUAD-CITIES STATION, UNITS 1 AND 2. SPECIAL REPORT NO. 3B, SUPPLEMENTARY INFORMATION CONCERNING CONDENSATE PUMP ROOM MODIFICATIONS.
27 Apr 73, 7p DOCKET-50265-181

Descriptors: (*Quad cities-1 reactor, *Mechanical structures), (*Quad cities-2 reactor, Mechanical structures), Leak testing, Openings, Pipelines, Pumps, Reactor components, Reactor licensing, Seals, Testing, Valves.

For abstract, see NSA 28 02, number 04747.

DOCKET-50254-195/GA PC$48.25/MF$1.45
Industrial Bio-Test Labs., Inc., Northbrook, Ill.
QUAD-CITIES STATION, UNITS 1 AND 2. SEMIANNUAL NONRADIOLOGICAL ENVIRONMENTAL REPORT, REVISED, AUGUST 1972--JANUARY 1973.
20 Apr 73, 921p DOCKET-50265-184

Descriptors: (*Quad cities-1 reactor, *Waste heat), (*Quad cities-2 reactor, Waste heat), Mississippi river, Monitoring, Reactor licensing.

For abstract, see NSA 28 03, number 07542.

DOCKET-50254-196/GA PC$3.75/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
QUAD-CITIES STATION, UNITS 1 AND 2. INSPECTION REPORTS NO. 050-254/71-13, NO. 050-265/71-13, AND NO. 050-254/71-14.
26 Apr 73, 33p DOCKET-50265-185

Descriptors: (*Quad cities-1 reactor, *Inspection), (*Quad cities-2 reactor, Inspection), Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04748.

DOCKET-50254-197/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
QUAD-CITIES STATION, UNITS 1 AND 2. INSPECTION REPORTS NO. 050-254/73-02 AND NO. 050-265/73-03.
30 Apr 73, 9p DOCKET-50265-186

Descriptors: (*Quad cities-1 reactor, *Inspection), (*Quad cities-2 reactor, Inspection), Reactor licensing, Reactor operation, Reactor safety.

For abstract, see NSA 28 02, number 04749.

DOCKET-50254-198/GA PC$3.00/MF$1.45
General Electric CO., San Jose, Calif. Nuclear Energy Div.
QUAD-CITIES STATION, UNITS 1 AND 2. RELIEF VALVE BLOWDOWN TEST PROGRAM.
30 Apr 73, 2p DOCKET-50265-187

Descriptors: (*Quad cities-1 reactor, *Valves), (*Quad cities-2 reactor, Valves), Blowdown, Containment systems, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04750.

DOCKET-50254-199/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Cordova, Ill.
QUAD-CITIES STATION, UNITS 1 AND 2. SETPOINT DRIFTS IN WATER LEVEL INSTRUMENTS.
3 May 73, 2p DOCKET-50265-188

Descriptors: (*Quad cities-1 reactor, *Reactor instrumentation), (*Quad cities-2 reactor, Reactor instrumentation), Calibration, Reactor licensing.

For abstract, see NSA 28 02, number 04751.

DOCKET-50255-152/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
PALISADES PLANT. REQUEST FOR PERSONNEL EXPOSURE RECORDS ON SEMIANNUAL BASIS.
24 Apr 73, 2p

Descriptors: (*Palisades-1 reactor, *Personnel), Radiation doses, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04752.

DOCKET-50255-153/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
PALISADES PLANT. TECHNICAL SPECIFICATIONS, REQUEST FOR MODIFICATION.
26 Apr 73, 3p

Descriptors: (*Palisades-1 reactor, *Reactor operation), Burnup, Fuel assemblies, Reactor licensing.

For abstract, see NSA 28 02, number 04753.

DOCKET-50255-156/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
PALISADES PLANT. INSPECTION REPORT NO. 050-255/73-01, FEBRUARY 2, 5, 6, 7, AND 28, 1973.
18 Apr 73, 20p

Descriptors: (*Palisades-1 reactor, *Inspection), Reactor licensing, Repair, Steam generators.

For abstract, see NSA 28 03, number 07543.

DOCKET-50255-157/GA PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich.
PALISADES PLANT. EFFLUENTS REPORTS, MARCH AND APRIL 1973.
11 May 73, 3p

Descriptors: (*Palisades-1 reactor, *Radioactive wastes), Environment, Gaseous wastes, Liquid wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04754.

DOCKET-50259-88/GA PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga.
BROWNS FERRY NUCLEAR POWER STATION, UNITS 1, 2, AND 3. FINAL DEFICIENCY REPORT ON CONTROL ROD DRIVE AND STANDBY GAS TREATMENT SYSTEMS.
23 Apr 73, 3p DOCKET-50260-82, DOCKET-50296-78

Descriptors: (*Browns ferry-1 reactor, *Control rod drives), (*Browns ferry-2 reactor, Control rod drives), (*Browns ferry-3 reactor, Control rod drives), Gaseous wastes, Radioactive waste disposal, Radioactive wastes, Reactor licensing, Seismic effects, Specifications.

For abstract, see NSA 28 02, number 04755.

DOCKET-50259-90/GA PC$3.50/MF$1.45
Tennessee Valley Authority, Chattanooga.
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. CORRECTIVE ACTION TAKEN AFTER INSPECTION OF DECEMBER 14 AND 20--21, 1972.
2 May 73, 29p

Descriptors: (*Browns ferry-1 reactor, *Eccs), Reactor licensing, Testing, Water hammer.

For abstract, see NSA 28 02, number 04756.

DOCKET-50259-91/GA PC$3.25/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. INSPECTION REPORT NO. 50-259/73-4.
8 May 73, 25p

Descriptors: (*Browns ferry-1 reactor, *Inspection), Quality assurance, Radiation protection, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04757.

DOCKET-50259-92/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
BROWNS FERRY NUCLEAR POWER STATION, UNITS 1, 2, AND 3. INQUIRY REPORT NOS. 50-259/73-1Q/CDR, 50-260/73-1Q/CDR, 50-296/73-1Q/CDR, LACK OF SEISMIC QUALIFICATIONS, CONTROL ROD DRIVE (CRD) AND STANDBY GAS TREATMENT (SGT) SYSTEMS.
9 May 73, 5p DOCKET-50260-84, DOCKET-50296-80

Descriptors: (*Browns ferry-1 reactor, *Control rod drives), (*Browns ferry-2 reactor, Control rod drives), (*Browns ferry-3 reactor, Control rod drives), Gaseous wastes, Pipelines, Radioactive waste processing, Reactor licensing, Seismic effects.

For abstract, see NSA 28 02, number 04758.

DOCKET-50261-160/GA PC$3.00/MF$1.45
South Carolina Pollution Control Authority, Columbia (Usa).
H. B. ROBINSON UNIT 2. NO APPLICABLE EFFLUENT LIMIT, SOUTH CAROLINA POLLUTION CONTROL AUTHORITY.
30 Mar 72, 2p

Descriptors: (*Robinson-2 reactor, *Environment), Radioactive wastes, Reactor licensing, Reactor operation, Waste heat.

For abstract, see NSA 28 02, number 04760.

DOCKET-50261-164/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
H. B. ROBINSON UNIT 2. TECHNICAL SPECIFICATIONS, CHANGE 16.
4 Apr 73, 4p

Descriptors: (*Robinson-2 reactor, *Filters), Charcoal, Efficiency, Methyl iodide, Reactor licensing, Specifications, Testing.

For abstract, see NSA 28 02, number 04761.

DOCKET-50261-171/GA PC$5.25/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.
H. B. ROBINSON UNIT 2. ROUTINE OPERATING REPORT NO. 5 FOR PERIOD OCTOBER 1--DECEMBER 31, 1972.
24 Apr 73, 6p

Descriptors: (*Robinson-2 reactor, *Reactor maintenance), Radioactive wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04762.

DOCKET-50261-172/GA PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.
H. B. ROBINSON UNIT 2. REFUELING WATER STORAGE TANK SPILL TO THE PLANT DRAINAGE SYSTEM.
1 May 73, 4p

Descriptors: (*Robinson-2 reactor, *Radioactive wastes), Liquid wastes, Reactor accidents, Reactor licensing.

For abstract, see NSA 28 02, number 04763.

DOCKET-50261-173/GA PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.
H.B. ROBINSON UNIT 2. INQUIRY REPORT NO. 50-261/73-2Q, UNPLANNED LIQUID RELEASE OF RADIOACTIVE MATERIAL FROM THE SITE.
7 May 73, 6p

Descriptors: (*Robinson-2 reactor, *Radioactive wastes), Environment, Liquid wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07544.

DOCKET-50261-175/GA PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.
H.B. ROBINSON UNIT 2. REFUELING WATER STORAGE TANK SPILL TO THE PLANT DRAINAGE SYSTEM.
11 May 73, 2p

Descriptors: (*Robinson-2 reactor, *Radiation monitoring), Environment, Radioactive wastes, Reactor licensing, Reactor operation, Storage, Tanks.

For abstract, see NSA 28 03, number 07545.

DOCKET-50261-176/GA PC$7.25/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.
H.B. ROBINSON UNIT 2. HYDROSTATIC TESTING OF STEAM GENERATORS.
11 May 73, 104p

Descriptors: (*Robinson-2 reactor, *Steam generators), Hydrodynamics, Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07546.

DOCKET-50263-201/GA PC$3.75/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE NO. 6.
3 Apr 73, 32p

Descriptors: (*Monticello reactor, *Management), Reactor licensing, Reactor operation, Specifications.

For abstract, see NSA 28 02, number 04764.

DOCKET-50263-202/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. INSPECTION REPORT NO. 050-263/73-03.
13 Apr 73, 9p

Descriptors: (*Monticello reactor, *Inspection), Reactor licensing, Reactor operation, Reactor safety.

For abstract, see NSA 28 02, number 04765.

DOCKET-50263-203/GA PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. NO. 12 DIESEL GENERATOR BREAKER CLOSED AUTOMATICALLY TO NO. 16 EMERGENCY BUS.
24 Apr 73, 1p

Descriptors: (*Monticello reactor, *Diesel engines), Circuit breakers, Reactor licensing, Reactor operation, Relays, Testing.

For abstract, see NSA 28 02, number 04766.

DOCKET-50263-204/GA PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. FAILURE OF LPCI INJECTION VALVE TO OPEN.
24 Apr 73, 1p

Descriptors: (*Monticello reactor, *Eccs), Failures, Reactor licensing, Reactor operation, Valves.

For abstract, see NSA 28 02, number 04767.

DOCKET-50263-205/GA PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. RHR SERVICE WATER PUMP SEAL PROBLEM.
19 Apr 73, 2p

Descriptors: (*Monticello reactor, *After-heat removal), Bushings, Equipment protection devices, Failures, Heating, Pumps, Reactor cooling systems, Reactor licensing, Reactor shutdown, Seals, Specifications.

For abstract, see NSA 28 02, number 04768.

DOCKET-50263-206/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. INSPECTION REPORT NO. 050-263/73-02.
16 Apr 73, 18p

Descriptors: (*Monticello reactor, *Inspection), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04769.

DOCKET-50265-189/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Cordova, Ill.
QUAD-CITIES STATION, UNIT 2. DIESEL GENERATOR AUTO STARTED.
7 May 73, 2p

Descriptors: (*Quad cities-2 reactor, *Diesel motors), Operation, Reactor licensing, Reactor shutdown.

For abstract, see NSA 28 03, number 07547.

DOCKET-50266-107/GA PC$3.00/MF$1.45
Wisconsin Electric Power CO., Milwaukee.
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2. HIGH STEAM FLOW TRIP SETPOINT MISCALIBRATION.
5 May 73, 2p DOCKET-50301-95

Descriptors: (*Point beach-1 reactor, *Reactor instrumentation), (*Point beach-2 reactor, Reactor instrumentation), Calibration, Reactor licensing, Specifications, Steam.

For abstract, see NSA 28 03, number 07548.

DOCKET-50266-108/GA PC$3.25/MF$1.45
Wisconsin Electric Power CO., Milwaukee.
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2. TECHNICAL SPECIFICATIONS, REQUEST FOR CHANGE 7.
5 May 73, 24p DOCKET-50301-96

Descriptors: (*Point beach-1 reactor, *Pressure vessels), (*Point beach-2 reactor, Pressure vessels), Reactor licensing, Cooling, Heating, Thermal stresses, Personnel, Reactor operation, Fluid poison control, Reactor control systems, Equipment protection devices, Reactor instrumentation.

For abstract, see NSA 28 03, number 07549.

DOCKET-50267-61/GA PC$8.25/MF$1.45
Colorado State Univ., Fort Collins.
FORT ST. VRAIN NUCLEAR GENERATING STATION. ANNUAL ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM REPORT AND SUMMARY OF 1969--1972 PROPREOPERATIONAL MEASUREMENTS.
Mar 73, 122p

Descriptors: (*Vrain reactor, *Environment), Radiation monitoring, Reactor licensing, Reactor sites.

For abstract, see NSA 28 02, number 04770.

DOCKET-50267-62/GA PC$3.00/MF$1.45
Public Service CO. Of Colorado, Denver.
FORT ST. VRAIN NUCLEAR GENERATION STATION. VALVE WALL THICKNESS.
26 Apr 73, 4p

Descriptors: (*Vrain reactor, *Valves), Inspection, Reactor licensing, Specifications, Thickness.

For abstract, see NSA 28 02, number 04771.

DOCKET-50269-100/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNIT 1. OPERATIONAL QUALITY ASSURANCE PROGRAM.
27 Apr 73, 11p

Descriptors: (*Oconee-1 reactor, *Quality assurance), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04772.

DOCKET-50269-101/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
OCONEE NUCLEAR STATION, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE NO. 1.
30 Apr 73, 3p

Descriptors: (*Oconee-1 reactor, *Reactor operation), Power, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04773.

DOCKET-50269-103/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3. SIMULTANEOUS ACTUATION OF THE SAFETY INJECTION SIGNAL ON BOTH UNITS OF A DUAL UNIT FACILITY, SUPPLEMENTARY INFORMATION.
2 May 73, 2p DOCKET-50270-85, DOCKET-50287-77

Descriptors: (*Oconee-1 reactor, *Equipment protection devices), (*Oconee-2 reactor, Equipment protection devices), (*Oconee-3 reactor, Equipment protection devices), Reactor licensing, Reactor operation, Reactor safety.

For abstract, see NSA 28 02, number 04774.

DOCKET-50269-104/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
OCONEE NUCLEAR STATION, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE NO. 2.
4 May 73, 3p

Descriptors: (*Oconee-1 reactor, *Respirators), Performance, Personnel, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04775.

DOCKET-50269-105/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3. ENDORSEMENT NO. 24 TO NELIA

POLICY NO. NF-182 AND MAELU POLICY NO. MF-61 WITH ENDORSEMENTS 1 THROUGH 11.
20 Apr 73, 20p DOCKET-50270-87, DOCKET-50287-87

Descriptors: (*Oconee-1 reactor, *Nuclear insurance), (*Oconee-2 reactor, Nuclear insurance), (*Oconee-3 reactor, Nuclear insurance), Liabilities, Reactor licensing.

For abstract, see NSA 28 02, number 04776.

DOCKET-50269-106/GA PC$5.75/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3. FINAL SAFETY ANALYSIS REPORT, REVISION 28.
1 May 73, 71p DOCKET-50270-88, DOCKET-50287-79

Descriptors: (*Oconee-1 reactor, *Reactor safety), (*Oconee-2 reactor, Reactor safety), (*Oconee-3 reactor, Reactor safety), Environment, Personnel, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04777.

DOCKET-50269-107/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3. REVIEW OF CONTROL CIRCUITS AND SAFETY RELATED EQUIPMENT.
3 May 73, 1p DOCKET-50270-89, DOCKET-50287-80

Descriptors: (*Oconee-1 reactor, *Equipment protection devices), (*Oconee-2 reactor, Equipment protection devices), (*Oconee-3 reactor, Equipment protection devices), Electric power, Failures, Reactor accidents, Reactor control systems, Reactor instrumentation, Reactor licensing, Reactor safety, Switching circuits.

For abstract, see NSA 28 02, number 04778.

DOCKET-50269-108/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNIT 1. FAILURE OF CORE FLOOD LINE ISOLATION VALVE CF-1 TO OPEN FULLY; FAILURE OF REACTOR BUILDING SPRAY VALVES TO OPEN DURING ES SYSTEM TESTING.
4 May 73, 3p

Descriptors: (*Oconee-1 reactor, *Valves), Eccs, Equipment protection devices, Failures, Reactor licensing, Switches.

For abstract, see NSA 28 03, number 07550.

DOCKET-50269-109/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNIT 1. REACTOR COOLANT PUMP OIL FIRE ON MARCH 6, 1973.
4 May 73, 15p

Descriptors: (*Oconee-1 reactor, *Fires), Primary coolant circuits, Pumps, Reactor licensing.

For abstract, see NSA 28 03, number 07551.

DOCKET-50269-111/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNIT 1. REQUEST FOR REMOVAL OF POWER RESTRICTION.
14 May 73, 4p

Descriptors: (*Oconee-1 reactor, *Reactor operation), Fuel densification, Power, Reactor licensing.

For abstract, see NSA 28 03, number 07552.

DOCKET-50270-91/GA PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNITS 2 AND 3. ACTIVE VALVE OPERABILITY.
1 May 73, 10p DOCKET-50287-82

Descriptors: (*Oconee-1 reactor, *Valves), (*Oconee-2 reactor, Valves), (*Oconee-3 reactor, Valves), Equipment protection devices, Performance testing, Reactor licensing, Specifications.

For abstract, see NSA 28 03, number 07553.

DOCKET-50271-174/GA PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. AO-73-10, RELIEF VALVE INITIATION TIME DELAY RELAY OUT OF CALIBRATION.
20 Apr 73, 2p

Descriptors: (*Vermont yankee reactor, *Valves), Calibration, Reactor licensing, Reactor operation, Relays.

For abstract, see NSA 28 02, number 04779.

DOCKET-50271-176/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
VERMONT YANKEE NUCLEAR POWER STATION. TECHNICAL SPECIFICATIONS, CHANGE NO. 7.
30 Apr 73, 3p

Descriptors: (*Vermont yankee reactor, *Respirators), Performance, Personnel, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04780.

DOCKET-50271-177/GA PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. FAULTY OVERCURRENT TRIP DELAY DEVICES IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Mar 73, 4p

Descriptors: (*Vermont yankee reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04781.

DOCKET-50271-178/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
VERMONT YANKEE NUCLEAR POWER STATION. INSPECTION REPORT NO. 50-271/73-01.
21 Mar 73, 15p

Descriptors: (*Vermont yankee reactor, *Inspection), Reactor licensing, Reactor start-up, Testing, Transformers.

For abstract, see NSA 28 02, number 04782.

DOCKET-50271-179/GA PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. AO-73-11, THE SBGT "B" TRAIN DID NOT START ON SIGNAL.
26 Apr 73, 1p

Descriptors: (*Vermont yankee reactor, *Gaseous wastes), Failures, Radioactive waste disposal, Reactor licensing, Stack disposal.

For abstract, see NSA 28 02, number 04783.

DOCKET-50271-180/GA PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. AO-73-12, VALVE FAILED TO OPEN ON MAY 7, 1973.
8 May 73, 1p

Descriptors: (*Vermont yankee reactor, *Valves), Eccs, Failures, Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 02, number 04784.

DOCKET-50272-56/GA PC$3.00/MF$1.45
Wilmington Metropolitan Area Planning Coordinating Council, New Castle Del. (Usa).
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF WILMINGTON METROPOLITAN AREA PLANNING COORDINATING COUNCIL.
29 Mar 73, 5p DOCKET-50311-56

Descriptors: (*Salem-1 reactor, *Environment), (*Salem-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04785.

DOCKET-50272-61/GA PC$3.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
3 Apr 73, 4p DOCKET-50311-61

Descriptors: (*Salem-1 reactor, *Equipment protection devices), (*Salem-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04786.

DOCKET-50272-62/GA PC$5.25/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. ACTION TAKEN TO CORRECT ITEMS OF VIOLATIONS BROUGHT TO ATTENTION FOLLOWING INSPECTION ON DECEMBER 12, 13, 14, AND 20, 1972.
5 Mar 73, 63p DOCKET-50311-62

Descriptors: (*Salem-1 reactor, *Quality assurance), (*Salem-2 reactor, Quality assurance), Fabrication, Quality control, Reactor licensing.

For abstract, see NSA 28 02, number 04787.

DOCKET-50272-63/GA PC$3.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. WATER QUALITY CERTIFICATION.
17 Apr 73, 5p DOCKET-50311-63

Descriptors: (*Salem-1 reactor, *Environment), (*Salem-2 reactor, Environment), Reactor licensing, Reactor sites, Water.

For abstract, see NSA 28 02, number 04788.

DOCKET-50272-64/GA PC$3.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. REVIEW OF CONTROL CIRCUITS FOR SAFETY RELATED EQUIPMENT.
23 Apr 73, 1p DOCKET-50311-64

Descriptors: (*Salem-1 reactor, *Equipment protection devices), (*Salem-2 reactor, Equipment protection devices), Control equipment, Reactor accidents, Reactor control systems, Reactor licensing, Reactor safety.

For abstract, see NSA 28 02, number 04789.

DOCKET-50272-65/GA PC$3.25/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
SALEM NUCLEAR GENERATING STATION, UNIT 1. INSPECTION REPORT NO. 50-272/73-03.
9 Apr 73, 22p

Descriptors: (*Salem-1 reactor, *Inspection), Education, Personnel, Reactor licensing.

For abstract, see NSA 28 02, number 04790.

DOCKET-50275-36/GA PC$3.00/MF$1.45
Resources Agency of California, Sacramento (Usa).
DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF RESOURCES AGENCY OF CALIFORNIA.
3 Apr 73, 9p DOCKET-50323-33

Descriptors: (*Diablo canyon-1 reactor, *Environment), (*Diablo canyon-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04791.

DOCKET-50275-39/GA PC$3.00/MF$1.45
Environmental Protection Agency, San Francisco, Calif. (Usa).
DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2. APPROVAL OF REVISIONS TO "WATER QUALITY CONTROL PLAN FOR CONTROL OF TEMPERATURE IN THE COASTAL AND INTERSTATE WATERS AND ENCLOSED BAYS AND ESTUARIES OF CALIFORNIA".
10 Aug 72, 1p DOCKET-50323-36

Descriptors: (*Diablo canyon-1 reactor, *Environment), (*Diablo canyon-2 reactor, Environment), California, Reactor licensing, Specifications, Thermal effluents.

For abstract, see NSA 28 03, number 07554.

DOCKET-50277-87/GA PC$25.00/MF$1.45
Philadelphia Electric CO., PA.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3. FINAL SAFETY ANALYSIS REPORT, AMENDMENT NO. 26.
30 Apr 73, 459p DOCKET-50278-82

Descriptors: (*Peach bottom-2 reactor, *Reactor safety), (*Peach bottom-3 reactor, Reactor safety), Containment systems, Quality assurance, Reactor control systems, Reactor cooling systems, Reactor instrumentation, Reactor kinetics, Reactor licensing, Reactor sites.

For abstract, see NSA 28 02, number 04792.

DOCKET-50277-89/GA PC$3.50/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. INSPECTION REPORT NO. 50-277/73-05.
29 Mar 73, 28p

Descriptors: (*Peach bottom-2 reactor, *Inspection), Education, Personnel, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04793.

DOCKET-50277-90/GA PC$3.25/MF$1.45
Philadelphia Electric CO., PA.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ACTION TAKEN TO CORRECT ITEMS OF VIOLATION BROUGHT TO ATTENTION FOLLOWING INSPECTION JANUARY 30, 31 AND FEBRUARY 1, 1973.
12 Apr 73, 25p

Descriptors: (*Peach bottom-2 reactor, *Electric cables), Fabrication, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04794.

DOCKET-50277-91/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3. INSPECTION REPORT NO. 50-277/73-06.
27 Apr 73, 15p

Descriptors: (*Peach bottom-2 reactor, *Inspection), (*Peach bottom-3 reactor, Inspection), Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07555.

DOCKET-50277-92/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. INSPECTION REPORT NO. 50-277/73-10.
23 Apr 73, 11p

Descriptors: (*Peach bottom-2 reactor, *Inspection), Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07556.

DOCKET-50278-84/GA PC$3.25/MF$1.45
Philadelphia Electric CO., PA.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 3. ACTION TAKEN TO CORRECT ITEMS OF VIOLATION BROUGHT TO ATTENTION FOLLOWING INSPECTIONS OF JANUARY 30, 31 AND FEBRUARY 1, 1973.
12 Apr 73, 24p

Descriptors: (*Peach bottom-3 reactor, *Electric cables), Fabrication, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04795.

DOCKET-50280-119/GA PC$3.00/MF$1.45
Reclaim the James, Richmond, VA. (Usa).
SURRY POWER STATION, UNITS 1 AND 2. INQUIRY FROM RECLAIM THE JAMES.
2 Apr 73, 2p DOCKET-50281-96

Descriptors: (*Surry-1 reactor, *Environment), (*Surry-2 reactor, Environment), Fishes, Reactor licensing, Reactor operation, Rivers.

For abstract, see NSA 28 02, number 04796.

DOCKET-50280-124/GA PC$3.00/MF$1.45
Virginia State Water Control Board, Richmond (Usa).
SURRY POWER STATION, UNITS 1 AND 2. STATE WATER CONTROL BOARD CERTIFICATE OF COMPLIANCE WITH APPLICABLE STATE WATER QUALITY STANDARDS.
11 Apr 73, 2p DOCKET-50281-99

Descriptors: (*Surry-1 reactor, *Environment), (*Surry-2 reactor, Environment), Reactor licensing, Thermal effluents.

For abstract, see NSA 28 03, number 07557.

DOCKET-50280-126/GA PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNIT 1. AO-S1-73-05, FAILURE OF MAIN STEAM LINE VALVE TO CLOSE.
16 Apr 73, 11p

Descriptors: (*Surry-1 reactor, *Valves), Failures, Pipelines, Reactor licensing, Reactor operation, Steam.

For abstract, see NSA 28 02, number 04797.

DOCKET-50280-127/GA PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNIT 1. AO-S1-73-06, FAILURE OF BORON INJECTION TANK OUTLET VALVE.
18 Apr 73, 6p

Descriptors: (*Surry-1 reactor, *Valves), Boron, Equipment protection devices, Failures, Fluid poison control, Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 02, number 04798.

DOCKET-50280-128/GA PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNIT 1. AO-S2-73-03, FAILURE OF AIR STARTING SYSTEM OF EMERGENCY DIESEL NO. 3.
18 Apr 73, 7p

Descriptors: (*Surry-1 reactor, *Diesel engines), Air, Compressors, Failures, Reactor licensing, Reactor operation, Repair, Testing.

For abstract, see NSA 28 02, number 04799.

DOCKET-50280-129/GA PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
1 May 73, 5p DOCKET-50281-103

Descriptors: (*Surry-1 reactor, *Equipment protection devices), (*Surry-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04800.

DOCKET-50280-130/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
SURRY POWER STATION, UNITS 1 AND 2. TECHNICAL SPECIFICATIONS, CHANGE 7.
2 May 72, 2p DOCKET-50281-104

Descriptors: (*Surry-1 reactor, *Respirators), (*Surry-2 reactor, Respirators), Aerosols, Performance, Personnel, Radiation protection, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04759.

DOCKET-50280-131/GA PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNIT 1. USRE-S1-73-02, REACTOR COOLANT FLOW COAST-DOWN MEASUREMENT.
25 Apr 73, 7p

Descriptors: (*Surry-1 reactor, *Primary coolant circuits), Liquid flow, Loss of coolant, Pumps, Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07558.

DOCKET-50280-132/GA PC$13.00/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNIT 1. START-UP TEST REPORT.
1 May 73, 217p

Descriptors: (*Surry-1 reactor, *Testing), Reactor licensing, Reactor start-up.

For abstract, see NSA 28 03, number 07559.

DOCKET-50280-133/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
SURRY POWER STATION, UNIT 1. INQUIRY REPORT NO. 50-280/73-5Q, EMERGENCY DIESEL GENERATOR FAILURE TO START.
18 Apr 73, 4p

Descriptors: (*Surry-1 reactor, *Diesel engines), Failures, Reactor licensing.

For abstract, see NSA 28 03, number 07560.

DOCKET-50281-102/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
SURRY POWER STATION, UNIT 2. INSPECTION REPORT NO. 50-281/73-4.
7 May 73, 14p

Descriptors: (*Surry-2 reactor, *Inspection), Reactor licensing, Reactor start-up, Testing.

For abstract, see NSA 28 02, number 04802.

DOCKET-50282-101/GA PC$3.00/MF$1.45
Minnesota Pollution Control Agency, Minneapolis (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF MINNESOTA POLLUTION CONTROL AGENCY.
30 Mar 73, 8p DOCKET-50306-96

Descriptors: (*Prairie island-1 reactor, *Environment), (*Prairie island-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04801.

DOCKET-50282-103/GA PC$3.00/MF$1.45
Federal Highway Administration, Homewood, Ill. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. U. S. DEPARTMENT OF TRANSPORTATION, COMMENT ON DRAFT ENVIRONMENTAL STATEMENT.
11 Apr 73, 1p DOCKET-50306-97

Descriptors: (*Prairie island-1 reactor, *Environment), (*Prairie island-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07561.

DOCKET-50282-107/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1. INSPECTION REPORT NO. 050-282/73-04.
11 Apr 73, 17p

Descriptors: (*Prairie island-1 reactor, *Inspection), Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04803.

DOCKET-50282-108/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. INSPECTION REPORTS NO. 050-282/73-07 AND NO. 050-306/73-04.
13 Apr 73, 7p DOCKET-50306-101

Descriptors: (*Prairie island-1 reactor, *Inspection), (*Prairie island-2 reactor, Inspection), Eccs, Pumps, Reactor licensing, Repair.

For abstract, see NSA 28 02, number 04804.

DOCKET-50282-110/GA PC$3.75/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. SAFETY EVALUATION, SUPPLEMENT NO. 2.
30 Apr 73, 35p DOCKET-50306-103

Descriptors: (*Prairie island-1 reactor, *Reactor safety), (*Prairie island-2 reactor, Reactor safety), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04805.

DOCKET-50282-111/GA PC$13.25/MF$1.45
Northern States Power CO., Minneapolis, Minn.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 34.
1 May 73, 225p DOCKET-50306-104

Descriptors: (*Prairie island-1 reactor, *Reactor safety), (*Prairie island-2 reactor, Reactor safety), Configuration, Containment buildings, Failures, Pipelines, Reactor licensing.

For abstract, see NSA 28 02, number 04806.

DOCKET-50282-112/GA PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. POLICY NO. NF-197, ENDORSEMENT 13.
9 Apr 73, 2p DOCKET-50306-105

Descriptors: (*Prairie island-1 reactor, *Nuclear insurance), (*Prairie island-2 reactor, Nuclear insurance), Liabilities, Reactor licensing.

For abstract, see NSA 28 02, number 04807.

DOCKET-50282-113/GA PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. APPLICATION FOR (A) CLASS 104B OPERATING LICENSES FOR UTILIZATION FACILITIES (B) SPECIAL NUCLEAR MATERIAL LICENSES AND (C) BY-PRODUCT MATERIAL LICENSES.
9 Apr 73, 19p DOCKET-50306-106

Descriptors: (*Prairie island-1 reactor, *Fuel densification), (*Prairie island-2 reactor, Fuel densification), Containment, Fuel cans, Loss of coolant, Pressure dependence, Reactor accidents, Reactor licensing, Very high temperature.

For abstract, see NSA 28 02, number 04808.

DOCKET-50282-114/GA PC$3.25/MF$1.45
Environmental Protection Agency, Washington, D.C. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.
4 May 73, 22p DOCKET-50306-107

Descriptors: (*Prairie island-1 reactor, *Environment), (*Prairie island-2 reactor, Environment), Radioactive wastes, Reactor licensing, Reactor operation, Waste heat.

For abstract, see NSA 28 02, number 04809.

DOCKET-50282-115/GA PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICES IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
17 Apr 73, 1p DOCKET-50306-108

Descriptors: (*Prairie island-1 reactor, *Equipment protection devices), (*Prairie island-2 reactor, Equipment protection devices), Circuit breakers, Failures, Reactor licensing.

For abstract, see NSA 28 03, number 07562.

DOCKET-50282-116/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. INSPECTION REPORTS NOS. 050-282/73-05 AND 050-306/73-02.
20 Apr 73, 7p DOCKET-50306-109

Descriptors: (*Prairie island-1 reactor, *Inspection), (*Prairie island-2 reactor, Inspection), Reactor licensing, Ultrasonic testing.

For abstract, see NSA 28 03, number 07563.

DOCKET-50285-91/GA PC$6.75/MF$1.45
Omaha Public Power District, Nebr.
FORT CALHOUN STATION, UNIT 1. JUSTIFICATION FOR 1420 MWT OPERATION OF THE FORT CALHOUN REACTOR UNDER FUEL DENSIFICATION CONDITIONS (CENPD-99).
6 Apr 73, 91p

Descriptors: (*Calhoun-1 reactor, *Fuel densification), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04810.

DOCKET-50285-92/GA PC$10.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
FORT CALHOUN STATION, UNIT 1. SAFETY EVALUATION AND SUPPLEMENT 1.
23 Apr 73, 159p

Descriptors: (*Calhoun-1 reactor, *Reactor safety), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04811.

DOCKET-50285-93/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Denver, Colo. Region IV.
FORT CALHOUN STATION, UNIT 1. INSPECTION REPORT NO. 50-285/73-05.
5 Apr 73, 15p

Descriptors: (*Calhoun-1 reactor, *Inspection), Fabrication, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04812.

DOCKET-50285-94/GA PC$3.50/MF$1.45
Eberline Instrument Corp., Santa Fe, N. Mex. Dept. Of Nuclear Sciences.
FORT CALHOUN STATION, UNIT 1. PREOPERATIONAL ENVIRONMENTAL RADIOACTIVITY SURVEILLANCE PROGRAM, FOURTH QUARTER, 1972.
24 Apr 73, 29p

Descriptors: (*Calhoun-1 reactor, *Radiation monitoring), Environment, Reactor licensing.

For abstract, see NSA 28 03, number 07564.

DOCKET-50286-77/GA PC$8.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 3. FINAL FACILITY DESCRIPTION AND SAFETY ANALYSIS REPORT, SUPPLEMENT NO. 17.
27 Apr 73, 117p

Descriptors: (*Indian point-3 reactor, *Reactor safety), Accidents, Equipment protection devices, Reactor licensing.

For abstract, see NSA 28 02, number 04813.

DOCKET-50286-78/GA PC$10.75/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 3. APPLICANT'S ENVIRONMENTAL REPORT, SUPPLEMENT 8.
30 Apr 73, 172p

Descriptors: (*Indian point-3 reactor, *Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04814.

DOCKET-50286-80/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
INDIAN POINT NUCLEAR GENERATING UNIT 3. INSPECTION REPORT NO. 50-286/73-03.
11 Apr 73, 14p

Descriptors: (*Indian point-3 reactor, *Inspection), Fabrication, Quality assurance, Reactor licensing.

For abstract, see NSA 28 02, number 04815.

DOCKET-50286-81/GA PC$4.50/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 3. FINAL FACILITY DESCRIPTION AND SAFETY ANALYSIS REPORT, SUPPLEMENT 18.
8 May 73, 47p

Descriptors: (*Indian point-3 reactor, *Reactor safety), Reactor licensing, Reactor sites.

For abstract, see NSA 28 03, number 07565.

DOCKET-50289-95/GA PC$3.00/MF$1.45
Metropolitan Edison CO., Reading, PA.
THREE MILE ISLAND NUCLEAR STATION, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS AND ENGINEERED SAFETY SYSTEMS.
10 Apr 73, 5p DOCKET-50320-45

Descriptors: (*Three mile island-1 reactor, *Equipment protection devices), (*Three mile island-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04816.

DOCKET-50289-96/GA PC$5.75/MF$1.45
Metropolitan Edison CO., Reading, PA.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 39.
27 Apr 73, 73p

Descriptors: (*Three mile island-1 reactor, *Loss of coolant), Eccs, Failures, Pipes, Reactor licensing, Reactor safety.

For abstract, see NSA 28 02, number 04817.

DOCKET-50289-97/GA PC$3.25/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. INSPECTION REPORT NO. 50-289/73-03.
18 Apr 73, 21p

Descriptors: (*Three mile island-1 reactor, *Inspection), Education, Personnel, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07566.

DOCKET-50289-98/GA PC$3.25/MF$1.45
Metropolitan Edison CO., Reading, PA.
THREE MILE ISLAND NUCLEAR STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, AMENDMENT 2.
2 May 73, 21p DOCKET-50320-46

Descriptors: (*Three mile island-1 reactor, *Power transmission), (*Three mile island-2 reactor, Power transmission), Environment, Mechanical structures, Reactor licensing.

For abstract, see NSA 28 03, number 07567.

DOCKET-50289-99/GA PC$3.75/MF$1.45
Metropolitan Edison CO., Reading, PA.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT NO. 40.
11 May 73, 32p

Descriptors: (*Three mile island-1 reactor, *Environment), Reactor licensing, Reactor operation, Specifications.

For abstract, see NSA 28 03, number 07568.

DOCKET-50293-132/GA PC$3.00/MF$1.45
Boston Edison CO., Mass.
PILGRIM NUCLEAR POWER STATION. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
8 Mar 73, 1p

Descriptors: (*Pilgrim reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04818.

DOCKET-50293-133/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
PILGRIM NUCLEAR POWER STATION. INQUIRY REPORT NO. 50-293/73-01Q.
17 Apr 73, 1p

Descriptors: (*Pilgrim reactor, *Control elements), Fuel assemblies, Reactor cores, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04819.

DOCKET-50293-135/GA PC$3.00/MF$1.45
Boston Edison CO., Mass.
PILGRIM NUCLEAR POWER STATION. UO-73-5, SERVICE WATER PUMP FAILURE. AO-73-14, TWO SWITCHES OUT OF CALIBRATION.
26 Apr 73, 3p

Descriptors: (*Pilgrim reactor, *Pumps), Failures, Reactor cooling systems, Reactor licensing, Reactor operation, Repair.

For abstract, see NSA 28 02, number 04820.

DOCKET-50293-136/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
PILGRIM NUCLEAR POWER STATION. INSPECTION REPORT NO. 50-293/73-01.
1 May 73, 12p

Descriptors: (*Pilgrim reactor, *Inspection), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04821.

DOCKET-50293-137/GA PC$3.00/MF$1.45
Boston Edison CO., Mass.
PILGRIM NUCLEAR POWER STATION. RESIN BREAK THROUGH IN COOLANT WATER, MAY 7, 1973.
8 May 73, 2p

Descriptors: (*Pilgrim reactor, *Water), Electric conductivity, Impurities, Primary coolant circuits, Reactor licensing, Reactor operation, Resins.

For abstract, see NSA 28 02, number 04822.

DOCKET-50293-138/GA PC$3.00/MF$1.45
Boston Edison CO., Mass.
PILGRIM NUCLEAR POWER STATION. AO-73-15, SWITCHES ISOLATED WITH REACTOR WATER TEMPERATURE ABOVE 212 EXP 0 F, 5/5/73. AO-73-16, DIFFERENTIAL PRESSURE INDICATING SWITCH FAILED TO CLOSE, 5/7/73.
8 May 73, 3p

Descriptors: (*Pilgrim reactor, *Switches), Failures, Reactor licensing, Reactor maintenance, Reactor operation, Specifications.

For abstract, see NSA 28 03, number 07569.

DOCKET-50293-139/GA PC$3.00/MF$1.45
Boston Edison CO., Mass.
PILGRIM NUCLEAR POWER STATION. UO-73-6, CONTAINMENT SPRAY VALVES INOPERABLE.
10 May 73, 2p

Descriptors: (*Pilgrim reactor, *Containment spray systems), Failures, Reactor licensing, Reactor operation, Valves.

For abstract, see NSA 28 03, number 07570.

DOCKET-50295-100/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. INSPECTION REPORT NO. 050-295/73-13.
10 Apr 73, 9p

Descriptors: (*Zion-1 reactor, *Inspection), Cleaning, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04823.

DOCKET-50295-101/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. INSPECTION REPORT NO. 050-295/73-14.
12 Apr 73, 10p

Descriptors: (*Zion-1 reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 02, number 04824.

DOCKET-50295-102/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. OPERATING ERROR IN TESTING OF SOURCE RANGE DETECTORS.
24 Apr 73, 2p

Descriptors: (*Zion-1 reactor, *Radiation detectors), Reactor licensing, Reactor operation, Specifications, Testing.

For abstract, see NSA 28 02, number 04825.

DOCKET-50295-104/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.

ZION STATION NUCLEAR POWER PLANT, UNIT 1. INSPECTION REPORT NO. 050-295/73-09.
30 Apr 73, 3p

Descriptors: (*Zion-1 reactor, *Inspection), Reactor licensing, Security.

For abstract, see NSA 28 02, number 04826.

DOCKET-50295-105/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNITS 1 AND 2. INDEMNITY AGREEMENT NO. B-59, AMENDMENT 3.
11 Apr 73, 3p DOCKET-50304-91

Descriptors: (*Zion-1 reactor, *Nuclear insurance), (*Zion-2 reactor, Nuclear insurance), Liabilities, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04827.

DOCKET-50295-106/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNITS 1 AND 2. REVIEW OF CONTROL CIRCUITS FOR SAFETY RELATED EQUIPMENT.
30 Apr 73, 1p DOCKET-50304-92

Descriptors: (*Zion-1 reactor, *Equipment protection devices), (*Zion-2 reactor, Equipment protection devices), Circuit breakers, Control systems, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04828.

DOCKET-50295-107/GA PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. FUEL DENSIFICATION REPORT, ADDENDUM.
4 May 73, 1p

Descriptors: (*Zion-1 reactor, *Fuel densification), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04829.

DOCKET-50295-108/GA PC$10.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 28.
4 May 73, 156p DOCKET-50304-93

Descriptors: (*Zion-1 reactor, *Reactor safety), (*Zion-2 reactor, Reactor safety), Containment shells, Failures, Fuel densification, Pipelines, Reactor accidents, Reactor licensing.

For abstract, see NSA 28 02, number 04830.

DOCKET-50295-109/GA PC$3.25/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION OF JANUARY 24 AND 26 AND FEBRUARY 5, 6, 13, 14 AND 23, 1973.
4 May 73, 22p

Descriptors: (*Zion-1 reactor, *Quality assurance), Reactor licensing, Specifications, Testing.

For abstract, see NSA 28 02, number 04831.

DOCKET-50295-112/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. INSPECTION REPORT NO. 050-295/73-18.
24 Apr 73, 9p

Descriptors: (*Zion-1 reactor, *Inspection), Radiation protection, Radioactive waste disposal, Reactor licensing.

For abstract, see NSA 28 03, number 07571.

DOCKET-50295-113/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. INSPECTION REPORT NO. 050-295/73-15.
24 Apr 73, 6p

Descriptors: (*Zion-1 reactor, *Inspection), Reactor licensing, Reactor operation, Reactor safety.

For abstract, see NSA 28 03, number 07572.

DOCKET-50295-115/GA PC$6.50/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNITS 1 AND 2. SPECIAL REPORT NO. 1, MAIN STEAM LINE CHECK VALVE MODIFICATIONS.
7 May 73, 87p DOCKET-50304-95

Descriptors: (*Zion-1 reactor, *Valves), (*Zion-2 reactor, Valves), Configuration, Pipelines, Reactor licensing, Specifications, Steam.

For abstract, see NSA 28 03, number 07573.

DOCKET-50295-116/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
ZION STATION NUCLEAR POWER PLANT, UNIT 1. AUTHORIZATION TO PROCEED WITH TESTING NOT TO EXCEED 163 MEGAWATTS THERMAL.
15 May 73, 2p

Descriptors: (*Zion-1 reactor, *Testing), Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07574.

DOCKET-50298-75/GA PC$3.00/MF$1.45
Nebraska Dept. Of Environmental Control, Lincoln (Usa).
COOPER NUCLEAR STATION. STATE CERTIFICATION THAT THERE IS NOT AN APPLICABLE EFFLUENT LIMITATION.
19 Apr 73, 2p

Descriptors: (*Cooper reactor, *Environment), Legal aspects, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07575.

DOCKET-50298-76/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Denver, Colo. Region IV.
COOPER NUCLEAR STATION. FAILURE OF CIRCUIT BREAKERS IN ENGINEERED SAFETY SYSTEMS.
20 Feb 73, 7p

Descriptors: (*Cooper reactor, *Equipment protection devices), Circuit breakers, Failures, Reactor licensing.

For abstract, see NSA 28 02, number 04832.

DOCKET-50298-77/GA PC$3.50/MF$1.45
Nebraska Public Power District, Columbus.
COOPER NUCLEAR STATION. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 21.
23 Apr 73, 29p

Descriptors: (*Cooper reactor, *Reactor sites), Reactor licensing, Reactor safety.

For abstract, see NSA 28 02, number 04833.

DOCKET-50301-93/GA PC$3.00/MF$1.45
Wisconsin Electric Power CO., Milwaukee.
POINT BEACH NUCLEAR POWER PLANT, UNIT 2. PROPOSAL TO DELETE FURTHER LOAD REJECTION TESTING.
23 Apr 73, 3p

Descriptors: (*Point beach-2 reactor, *Electric generators), Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 02, number 04834.

DOCKET-50301-94/GA PC$3.00/MF$1.45
Wisconsin Electric Power CO., Milwaukee.
POINT BEACH NUCLEAR POWER PLANT, UNIT 2. SUDDEN CLOSURE OF MAIN STEAM STOP VALVES.
2 May 73, 4p

Descriptors: (*Point beach-2 reactor, *Valves), Pipelines, Reactor licensing, Reactor operation, Steam.

For abstract, see NSA 28 02, number 04835.

DOCKET-50302-69/GA PC$3.00/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. INADVERTENT DISABLING OF COMPONENTS.
19 Apr 73, 1p

Descriptors: (*Crystal river-3 reactor, *Electrical equipment), Circuit breakers, Performance, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04836.

DOCKET-50302-70/GA PC$3.00/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. FAULTY OVERCURRENT TRIP RELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
1 May 73, 5p

Descriptors: (*Crystal river-3 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04837.

DOCKET-50302-71/GA PC$3.00/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION ON JANUARY 23–25, 1973.
23 Mar 73, 20p

Descriptors: (*Crystal river-3 reactor, *Nondestructive testing), Fabrication, Reactor licensing, Specifications, Welding.

For abstract, see NSA 28 03, number 07576.

DOCKET-50302-72/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. INSPECTION REPORT NO. 50-302/73-2.
17 Apr 73, 14p

Descriptors: (*Crystal river-3 reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 03, number 07577.

DOCKET-50304-94/GA PC$7.25/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNIT 2. FUEL DENSIFICATION.
4 May 73, 102p WCAP-8123

Descriptors: (*Zion-2 reactor, *Fuel densification), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04838.

DOCKET-50305-78/GA PC$3.00/MF$1.45
Wisconsin Public Service Corp., Green Bay.
KEWAUNEE NUCLEAR POWER PLANT. FUEL DENSIFICATION.
24 Apr 73, 1p

Descriptors: (*Kewaunee reactor, *Fuel densification), Reactor licensing.

For abstract, see NSA 28 02, number 04839.

DOCKET-50305-79/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
KEWAUNEE NUCLEAR POWER PLANT. INSPECTION REPORT NO. 050-305/73-04.
1 May 73, 15p

Descriptors: (*Kewaunee reactor, *Inspection), Radiation protection, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04840.

DOCKET-50305-80/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
KEWAUNEE NUCLEAR POWER PLANT. INSPECTION REPORT NO. 050-305/73-03.
30 Apr 73, 17p

Descriptors: (*Kewaunee reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 03, number 07578.

DOCKET-50305-81/GA PC$5.25/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
KEWAUNEE NUCLEAR POWER PLANT. SAFETY EVALUATION, SUPPLEMENT 2.
10 May 73, 62p

Descriptors: (*Kewaunee reactor, *Reactor safety), Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07579.

DOCKET-50309-107/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
MAINE YANKEE ATOMIC POWER STATION. INSPECTION REPORT NO. 50-309/73-02.
20 Mar 73, 5p

Descriptors: (*Maine yankee reactor, *Inspection), Quality assurance, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04841.

DOCKET-50309-109/GA PC$3.00/MF$1.45
Maine Yankee Atomic Power CO., Westboro, Mass.
MAINE YANKEE ATOMIC POWER STATION. PLANT LOAD REDUCED TO BELOW 75% POWER DUE TO LOSS OF ONE IN FOUR CIRCULATING PUMPS.
19 Apr 73, 1p

Descriptors: (*Maine yankee reactor, *Pumps), Failures, Reactor cooling systems, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04842.

DOCKET-50309-110/GA PC$3.75/MF$1.45
Maine Yankee Atomic Power CO., Westboro, Mass.
MAINE YANKEE ATOMIC POWER STATION. MONTHLY REPORT 3-73, MARCH 1973.
26 Apr 73, 34p

Descriptors: (*Maine yankee reactor, *Reactor maintenance), Radioactive wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04843.

DOCKET-50309-111/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
MAINE YANKEE ATOMIC POWER STATION. TECHNICAL SPECIFICATIONS, CHANGE NO. 2.
30 Apr 73, 3p

Descriptors: (*Maine yankee reactor, *Primary coolant circuits), Reactor licensing, Reactor operation, Specifications.

For abstract, see NSA 28 02, number 04844.

DOCKET-50309-112/GA PC$3.00/MF$1.45
Maine Yankee Atomic Power CO., Westboro, Mass.
MAINE YANKEE ATOMIC POWER STATION. QUALITY ASSURANCE PROGRAM.
20 Apr 73, 7p

Descriptors: (*Maine yankee reactor, *Quality assurance), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04845.

DOCKET-50312-67/GA PC$3.00/MF$1.45
Resources Agency of California, Sacramento (Usa).
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF THE STATE OF CALIFORNIA NOT INCLUDED.
30 Mar 73, 1p

Descriptors: (*Rancho seco-1 reactor, *Environment), Reactor licensing.

For abstract, see NSA 28 02, number 04846.

DOCKET-50312-71/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Berkeley, Calif. (Usa). Region V.
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1. SAFETY RELATED CIRCUIT BREAKERS.
25 Apr 73, 6p

Descriptors: (*Rancho seco-1 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04847.

DOCKET-50312-72/GA PC$3.00/MF$1.45
Sacramento Municipal Utility District, Calif.
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1. NUCLEAR ENERGY LIABILITY INSURANCE FOR SPECIAL NUCLEAR MATERIAL LICENSE NO. SNM-1333.
12 Apr 72, 15p

Descriptors: (*Rancho seco-1 reactor, *Nuclear insurance), Liabilities, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04848.

DOCKET-50312-73/GA PC$3.00/MF$1.45
Sacramento Municipal Utility District, Calif.
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1. REVIEW OF CONTROL CIRCUITS OF SAFETY RELATED EQUIPMENT.
3 May 73, 3p

Descriptors: (*Rancho seco-1 reactor, *Equipment protection devices), Circuit breakers, Control equipment, Reactor accidents, Reactor control systems, Reactor instrumentation, Reactor licensing, Reactor safety.

For abstract, see NSA 28 02, number 04849.

DOCKET-50312-74/GA PC$10.00/MF$1.45
Sacramento Municipal Utility District, Calif.
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 21.
7 May 73, 160p

Descriptors: (*Rancho seco-1 reactor, *Reactor safety), Electrical equipment, Equipment protection devices, Pipelines, Radioactive waste disposal, Reactor cooling systems, Reactor kinetics, Reactor licensing, Reactor sites, Testing.

For abstract, see NSA 28 02, number 04850.

DOCKET-50313-74/GA PC$3.00/MF$1.45
Arkansas Power and Light CO., Little Rock.
ARKANSAS NUCLEAR ONE, UNIT 1. ENGINEERED SAFEGUARD EQUIPMENT, CIRCUIT BREAKERS.
11 Apr 73, 2p

Descriptors: (*Arkansas-1 reactor, *Circuit breakers), Equipment protection devices, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04851.

DOCKET-50313-75/GA PC$11.75/MF$1.45
Arkansas Power and Light CO., Little Rock.
ARKANSAS NUCLEAR ONE, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 37.
27 Apr 73, 191p

Descriptors: (*Arkansas-1 reactor, *Reactor safety), Economics, Equipment protection devices, Mechanical structures, Radioactive waste disposal, Reactor accidents, Reactor cooling systems, Reactor instrumentation, Reactor licensing.

For abstract, see NSA 28 03, number 07580.

DOCKET-50313-76/GA PC$3.25/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
ARKANSAS NUCLEAR ONE, UNIT 1. INSPECTION REPORT NO. 50-313/73-4.
17 Apr 73, 23p

Descriptors: (*Arkansas-1 reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 03, number 07581.

DOCKET-50313-77/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
ARKANSAS NUCLEAR ONE, UNIT 1. LIMITORQUE VALVE OPERATOR FAILURES.
4 Dec 72, 8p

Descriptors: (*Arkansas-1 reactor, *Valves), Failures, Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07582.

DOCKET-50315-110/GA PC$3.00/MF$1.45
Michigan Dept. Of Public Health, Lansing (Usa).

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF STATE OF MICHIGAN DEPARTMENT OF PUBLIC HEALTH.
10 Apr 73, 2p DOCKET-50316-109

Descriptors: (*Cook-1 reactor, *Environment), (*Cook-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04852.

DOCKET-50315-115/GA PC$3.25/MF$1.45
American Electric Power Service Corp., New York.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION ON JANUARY 30--31, AND FEBRUARY 1, 1973.
28 Mar 73, 24p DOCKET-50316-114

Descriptors: (*Cook-1 reactor, *Quality assurance), (*Cook-2 reactor, Quality assurance), Reactor components, Reactor licensing.

For abstract, see NSA 28 02, number 04853.

DOCKET-50315-116/GA PC$3.00/MF$1.45
Indiana and Michigan Electric CO., New York.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. AVAILABILITY OF SHUTDOWN FUNDS.
25 Apr 73, 3p DOCKET-50316-115

Descriptors: (*Cook-1 reactor, *Reactor shutdown), (*Cook-2 reactor, Reactor shutdown), Cost, Reactor licensing.

For abstract, see NSA 28 02, number 04854.

DOCKET-50315-117/GA PC$3.75/MF$1.45
Indiana and Michigan Power CO., New York.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 43.
1 May 73, 33p DOCKET-50316-116

Descriptors: (*Cook-1 reactor, *Reactor safety), (*Cook-2 reactor, Reactor safety), Electrical equipment, Environment, Equipment protection devices, Radiation monitoring, Reactor licensing, Steam generators.

For abstract, see NSA 28 02, number 04855.

DOCKET-50317-100/GA PC$4.25/MF$1.45
Baltimore Gas and Electric CO., MD.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 37.
3 May 73, 45p DOCKET-50318-95

Descriptors: (*Calvert cliffs-1 reactor, *Reactor safety), (*Calvert cliffs-2 reactor, Reactor safety), Electrical equipment, Reactor accidents, Reactor licensing, Specifications, Steam generators, Steam turbines.

For abstract, see NSA 28 02, number 04863.

DOCKET-50317-101/GA PC$3.75/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. SAFETY EVALUATION, SUPPLEMENT 1.
4 May 73, 35p DOCKET-50318-96

Descriptors: (*Calvert cliffs-1 reactor, *Reactor safety), (*Calvert cliffs-2 reactor, Reactor safety), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04864.

DOCKET-50317-93/GA PC$4.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. SAFETY EVALUATION, SUPPLEMENT 1.
4 May 73, 39p DOCKET-50318-90

Descriptors: (*Calvert cliffs-1 reactor, *Reactor safety), (*Calvert cliffs-2 reactor, Reactor safety), Reactor licensing.

For abstract, see NSA 28 02, number 04856.

DOCKET-50317-94/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 4p DOCKET-50318-91

Descriptors: (*Calvert cliffs-1 reactor, *Equipment protection devices), (*Calvert cliffs-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04857.

DOCKET-50317-95/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 1. INSPECTION REPORT NO. 50-317/73-05.
2 Apr 73, 6p

Descriptors: (*Calvert cliffs-1 reactor, *Inspection), Quality assurance, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04858.

DOCKET-50317-96/GA PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 36.
27 Apr 73, 397p DOCKET-50318-92

Descriptors: (*Calvert cliffs-1 reactor, *Reactor safety), (*Calvert cliffs-2 reactor, Reactor safety), Failures, Pipes, Specifications.

For abstract, see NSA 28 02, number 04859.

DOCKET-50317-97/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. INSPECTION REPORTS NOS. 50-317/73-02 AND 50-318/73-01.
26 Mar 73, 20p DOCKET-50318-93

Descriptors: (*Calvert cliffs-1 reactor, *Inspection), (*Calvert cliffs-2 reactor, Inspection), Concretes, Containment shells, Reactor licensing, Repair.

For abstract, see NSA 28 02, number 04860.

DOCKET-50317-98/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 1. INQUIRY REPORT NO. 50-317/73-01Q, CONSTRUCTION/EQUIPMENT DEFICIENCY. RUSTED CONDITION OF EMERGENCY DIESEL GENERATORS.
30 Mar 73, 3p

Descriptors: (*Calvert cliffs-1 reactor, *Diesel engines), Performance, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04861.

DOCKET-50317-99/GA PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. QUALITY ASSURANCE PROGRAM.
3 May 73, 2p DOCKET-50318-94

Descriptors: (*Calvert cliffs-1 reactor, *Quality assurance), (*Calvert cliffs-2 reactor, Quality assurance), Reactor licensing.

For abstract, see NSA 28 02, number 04862.

DOCKET-50320-47/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
THREE MILE ISLAND NUCLEAR STATION, UNIT 2. INSPECTION REPORT NO. 50-320/73-01.
19 Apr 73, 7p

Descriptors: (*Three mile island-2 reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 03, number 07583.

DOCKET-50321-77/GA PC$9.75/MF$1.45
Georgia Power CO., Atlanta.
EDWIN I. HATCH NUCLEAR PLANT, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 32.
16 Apr 73, 154p

Descriptors: (*Hatch-1 reactor, *Reactor safety), Containment systems, Reactor control systems, Reactor instrumentation, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04865.

DOCKET-50321-78/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 5p DOCKET-50366-39

Descriptors: (*Hatch-1 reactor, *Equipment protection devices), (*Hatch-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04866.

DOCKET-50321-79/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
EDWIN I. HATCH NUCLEAR PLANT, UNIT 1. LIMITORQUE VALVE OPERATOR FAILURES.
4 Dec 72, 8p

Descriptors: (*Hatch-1 reactor, *Valves), Electric motors, Reactor licensing, Specifications, Switches.

For abstract, see NSA 28 03, number 07584.

DOCKET-50322-35/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
SHOREHAM NUCLEAR POWER STATION, UNIT 1. INSPECTION REPORT NO. 50-322/73-02.
17 Apr 73, 11p

Descriptors: (*Shoreham reactor, *Inspection), Quality assurance, Reactor licensing.

For abstract, see NSA 28 03, number 07585.

DOCKET-50323-39/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Berkeley, Calif. (Usa). Region V.

DIABLO CANYON NUCLEAR POWER PLANT, UNIT 2. VENDOR INSPECTION REPORT NO. 99900076/73-05.
19 Apr 73, 10p

Descriptors: (*Diablo canyon-2 reactor, *Inspection), Fabrication, Pressure vessels, Reactor licensing, Testing.

For abstract, see NSA 28 03, number 07586.

DOCKET-50324-77/GA PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2. RADIOLOGICAL RELEASES.
30 Apr 73, 1p DOCKET-50325-78

Descriptors: (*Brunswick-1 reactor, *Radioactive wastes), (*Brunswick-2 reactor, Radioactive wastes), Gaseous wastes, Radiation doses, Reactor licensing.

For abstract, see NSA 28 02, number 04867.

DOCKET-50324-78/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 5p DOCKET-50325-79

Descriptors: (*Brunswick-1 reactor, *Equipment protection devices), (*Brunswick-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04868.

DOCKET-50324-79/GA PC$3.25/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2. INSPECTION REPORTS NOS. 50-325/73-2 AND 50-324/73-2.
17 Apr 73, 21p DOCKET-50325-80

Descriptors: (*Brunswick-1 reactor, *Inspection), (*Brunswick-2 reactor, Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 03, number 07587.

DOCKET-50327-38/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 6p DOCKET-50328-36

Descriptors: (*Sequoyah-1 reactor, *Equipment protection devices), (*Sequoyah-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04869.

DOCKET-50327-39/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2. VENDOR INSPECTION REPORT NO. 999-047/73-3.
28 Mar 73, 15p DOCKET-50328-37

Descriptors: (*Sequoyah-1 reactor, *Inspection), (*Sequoyah-2 reactor, Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 02, number 04870.

DOCKET-50331-96/GA PC$3.00/MF$1.45
Iowa Electric Light and Power CO., Cedar Rapids.
DUANE ARNOLD ENERGY CENTER. WESTINGHOUSE CIRCUIT BREAKERS.
14 Mar 73, 1p

Descriptors: (*Duane arnold-1 reactor, *Circuit breakers), Reactor licensing, Specifications.

For abstract, see NSA 28 03, number 07588.

DOCKET-50333-89/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
23 Feb 73, 4p

Descriptors: (*Fitzpatrick reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04871.

DOCKET-50333-90/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. INSPECTION REPORT NO. 50-333/73-03.
29 Mar 73, 11p

Descriptors: (*Fitzpatrick reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 02, number 04872.

DOCKET-50333-91/GA PC$3.00/MF$1.45
Power Authority of the State of New York.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. VALVE WALL THICKNESS.
4 Apr 72, 1p

Descriptors: (*Fitzpatrick reactor, *Valves), Inspection, Reactor licensing, Thickness.

For abstract, see NSA 28 02, number 04873.

DOCKET-50333-92/GA PC$3.00/MF$1.45
Power Authority of the State of New York.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. INTAKE STRUCTURE BAR HEATING.
4 May 73, 2p

Descriptors: (*Fitzpatrick reactor, *Reactor cooling systems), Heating, Mechanical structures, Reactor licensing.

For abstract, see NSA 28 03, number 07589.

DOCKET-50334-60/GA PC$43.75/MF$1.45
Duquesne Light CO., Pittsburgh, PA.
BEAVER VALLEY POWER STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 1.
23 Apr 73, 834p

Descriptors: (*Beaver valley-1 reactor, *Reactor safety), Containment systems, Radioactive wastes, Reactor licensing, Reactor sites, Safety engineering.

For abstract, see NSA 28 02, number 04874.

DOCKET-50334-63/GA PC$3.00/MF$1.45
Duquesne Light CO., Pittsburgh, PA.
BEAVER VALLEY POWER STATION, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICES IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
9 Mar 73, 1p

Descriptors: (*Beaver valley-1 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04875.

DOCKET-50334-64/GA PC$3.00/MF$1.45
Duquesne Light CO., Pittsburgh, PA.
BEAVER VALLEY POWER STATION, UNIT 1. DRAFT ENVIRONMENTAL STATEMENT, APPLICANT'S COMMENTS.
1 May 73, 12p

Descriptors: (*Beaver valley-1 reactor, *Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07590.

DOCKET-50334-66/GA PC$25.25/MF$1.45
Duquesne Light CO., Pittsburgh, PA.
BEAVER VALLEY POWER STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 2.
7 May 73, 464p

Descriptors: (*Beaver valley-1 reactor, *Reactor safety), Containment shells, Electrical equipment, Reactor control systems, Reactor instrumentation, Reactor licensing, Reactor sites, Steam generators.

For abstract, see NSA 28 03, number 07591.

DOCKET-50335-56/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
ST. LUCIE PLANT, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 5p

Descriptors: (*Lucie-1 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04876.

DOCKET-50335-57/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
ST. LUCIE PLANT, UNIT 1. INSPECTION REPORT NO. 50-335/73-2.
13 Apr 73, 18p

Descriptors: (*Lucie-1 reactor, *Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 02, number 04877.

DOCKET-50336-55/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 2. FAULTY OVERCURRENT TRIP DELAY DEVICES IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEM.
22 Mar 73, 1p

Descriptors: (*Millstone-2 reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04878.

DOCKET-50338-61/GA PC$9.50/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. LICENSE APPLICATION.
16 Mar 73, 146p DOCKET-50339-59

Descriptors: (*North anna-1 reactor, *Reactor operation), (*North anna-2 reactor, Reactor operation), Reactor licensing.

For abstract, see NSA 28 02, number 04879.

DOCKET-50338-62/GA PC$25.75/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 1.
3 Jan 73, 475p DOCKET-50339-60

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Buildings, Configuration, Reactor licensing, Reactor sites.

For abstract, see NSA 28 02, number 04880.

DOCKET-50338-63/GA PC$32.50/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 2.
3 Jan 73, 606p DOCKET-50339-61

Descriptors: (*North anna-1 reactor, *Mechanical structures), (*North anna-2 reactor, Mechanical structures), Design, Reactor components, Reactor safety.

For abstract, see NSA 28 02, number 04881.

DOCKET-50338-64/GA PC$4.00/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. APPLICANT'S ENVIRONMENTAL STATEMENT, OPERATING LICENSE STAGE, APPENDIX K.
30 Apr 73, 24p DOCKET-50339-62

Descriptors: (*North anna-1 reactor, *Environment), (*North anna-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04882.

DOCKET-50338-65/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 5p DOCKET-50339-63

Descriptors: (*North anna-1 reactor, *Equipment protection devices), (*North anna-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04883.

DOCKET-50338-66/GA PC$30.25/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 3.
3 Jan 73, 563p DOCKET-50339-65

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Reactor cooling systems, Reactor licensing.

For abstract, see NSA 28 02, number 04884.

DOCKET-50338-67/GA PC$36.50/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 4.
3 Jan 73, 690p DOCKET-50339-66

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Equipment protection devices, Reactor control systems, Reactor instrumentation, Reactor licensing.

For abstract, see NSA 28 02, number 04885.

DOCKET-50338-68/GA PC$33.25/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 5.
3 Jan 73, 622p DOCKET-50339-67

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Electrical equipment, Reactor licensing, Steam generators, Steam turbines.

For abstract, see NSA 28 02, number 04886.

DOCKET-50338-69/GA PC$24.25/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 6.
3 Jan 73, 444p DOCKET-50339-68

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Radiation protection, Radioactive waste disposal, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04887.

DOCKET-50338-70/GA PC$26.50/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 7.
3 Jan 73, 489p DOCKET-50339-69

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Reactor accidents, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04888.

DOCKET-50338-71/GA PC$23.75/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, VOLUME 8.
3 Jan 73, 432p DOCKET-50339-70

Descriptors: (*North anna-1 reactor, *Reactor safety), (*North anna-2 reactor, Reactor safety), Quality assurance, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04889.

DOCKET-50340-7/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
SEABROOK NUCLEAR STATION, UNIT 1. INSPECTION REPORT NO. 50-340/73-01.
21 Mar 73, 7p

Descriptors: (*Seabrook-1 reactor, *Inspection), Quality assurance, Reactor licensing.

For abstract, see NSA 28 02, number 04890.

DOCKET-50341-53/GA PC$3.00/MF$1.45
Detroit Edison CO., Mich.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 2. NDT OF CAST PUMPS AND VALVES LESS THAN 4 INCHES DIAMETER.
17 Apr 73, 2p

Descriptors: (*Enrico fermi-2 reactor, *Pumps), Nondestructive testing, Reactor licensing, Valves.

For abstract, see NSA 28 02, number 04891.

DOCKET-50341-54/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 2. INSPECTION REPORT NO. 050-341/73-04.
2 Apr 73, 7p

Descriptors: (*Enrico fermi-2 reactor, *Inspection), Containment shells, Reactor licensing, Testing.

For abstract, see NSA 28 02, number 04892.

DOCKET-50341-55/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 2. VENDOR INSPECTION REPORT NO. 999-036/73-01.
2 Apr 73, 7p

Descriptors: (*Enrico fermi-2 reactor, *Inspection), Pressure vessels, Reactor licensing.

For abstract, see NSA 28 02, number 04893.

DOCKET-50341-57/GA PC$3.00/MF$1.45
Detroit Edison CO., Mich.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 2. VENDOR INSPECTION AUDIT REPORT NO. 999-020/73-01.
16 Apr 73, 2p

Descriptors: (*Enrico fermi-2 reactor, *Fabrication), Inspection, Reactor licensing.

For abstract, see NSA 28 02, number 04894.

DOCKET-50341-58/GA PC$3.25/MF$1.45
Detroit Edison CO., Mich.
ENRICO FERMI ATOMIC POWER PLANT, UNIT 2. CONTROL ROD GUIDE TUBE COLLAPSE.
9 May 73, 22p

Descriptors: (*Enrico fermi-2 reactor, *Control elements), Failures, Reactor licensing, Tubes.

For abstract, see NSA 28 03, number 07592.

DOCKET-50344-61/GA PC$3.00/MF$1.45
Portland General Electric CO., Oreg.
TROJAN NUCLEAR PLANT. SAFETY RELATED CIRCUIT BREAKERS.
9 Apr 73, 6p

Descriptors: (*Trojan reactor, *Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04895.

DOCKET-50344-62/GA PC$3.50/MF$1.45
Portland General Electric CO., Oreg.
TROJAN NUCLEAR PLANT. STEPS TAKEN TO CORRECT ITEMS BROUGHT TO ATTENTION FOLLOWING INSPECTION, JANUARY 29--FEBRUARY 1, 1973.
22 Mar 73, 29p

Descriptors: (*Trojan reactor, *Supports), Fabrication, Fasteners, Quality assurance, Reactor licensing.

For abstract, see NSA 28 02, number 04896.

DOCKET-50344-63/GA PC$3.00/MF$1.45
Portland General Electric CO., Oreg.
TROJAN NUCLEAR PLANT. DRAFT ENVIRONMENTAL STATEMENT, RESPONSE TO AGENCY COMMENTS.
27 Apr 73, 10p

Descriptors: (*Trojan reactor, *Environment), Radioactive wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04897.

DOCKET-50346-58/GA PC$3.00/MF$1.45
Toledo Edison CO., Ohio.
DAVIS--BESSE NUCLEAR POWER STATION. FAULTY CIRCUIT BREAKER TRIPS.
12 Mar 73, 1p

Descriptors: (*Davis besse reactor, *Circuit breakers), Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04898.

DOCKET-50348-57/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 5p DOCKET-50364-48

Descriptors: (*Farley-1 reactor, *Equipment protection devices), (*Farley-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04899.

DOCKET-50348-58/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2. INSPECTION REPORTS NOS. 50-348/73-1 AND 50-364/73-1 WITH ATTACHED INQUIRY REPORTS NOS. 50-348/73-1Q/CDR AND 50-364/73-1Q/CDR: DAMAGED POWER AND LIGHTING CABLE.
27 Mar 73, 17p DOCKET-50364-49

Descriptors: (*Farley-1 reactor, *Electric cables), (*Farley-2 reactor, Electric cables), Fabrication, Inspection, Reactor licensing.

For abstract, see NSA 28 02, number 04900.

DOCKET-50348-59/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1. VENDOR INSPECTION REPORT NO. 999-47/73-1.
5 Apr 73, 13p

Descriptors: (*Farley-1 reactor, *Inspection), Pressurizers, Reactor licensing, Steam generators.

For abstract, see NSA 28 02, number 04901.

DOCKET-50354-37/GA PC$4.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
NEWBOLD ISLAND NUCLEAR GENERATING STATION, UNITS 1 AND 2. RESPONSES TO COMMENTS ON DRAFT ENVIRONMENTAL STATEMENT.
19 Apr 73, 36p DOCKET-50355-36

Descriptors: (*Newbold island-1 reactor, *Environment), (*Newbold island-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04902.

DOCKET-50354-38/GA PC$3.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
NEWBOLD ISLAND NUCLEAR GENERATING STATION, UNITS 1 AND 2. DELAWARE RIVER BASIN COMMISSION CONDITIONAL APPROVAL REGARDING WATER AVAILABILITY.
19 Apr 73, 10p DOCKET-50355-37

Descriptors: (*Newbold island-1 reactor, *Environment), (*Newbold island-2 reactor, Environment), Reactor licensing, Reactor sites.

For abstract, see NSA 28 02, number 04903.

DOCKET-50354-39/GA PC$3.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J.
NEWBOLD ISLAND NUCLEAR GENERATING STATION, UNIT 1. DRAFT ENVIRONMENTAL STATEMENT, ADDITIONAL RESPONSES TO COMMENTS.
2 May 73, 12p DOCKET-50355-38

Descriptors: (*Newbold island-1 reactor, *Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04904.

DOCKET-50358-46/GA PC$3.00/MF$1.45
Cincinnati Gas and Electric CO., Ohio.
WILLIAM H. ZIMMER NUCLEAR POWER STATION, UNIT 1. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS.
6 Apr 73, 1p

Descriptors: (*Zimmer-1 reactor, *Circuit breakers), Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04905.

DOCKET-50361-41/GA PC$20.00/MF$1.45
Southern California Edison CO., Rosemead, Calif.
SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3. OCEAN CURRENT INFORMATION.
12 Apr 73, 359p DOCKET-50362-40

Descriptors: (*San onofre-2 reactor, *Reactor sites), (*San onofre-3 reactor, Reactor sites), Reactor licensing, Seas.

For abstract, see NSA 28 02, number 04906.

DOCKET-50367-38/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
BAILLY GENERATING STATION, NUCLEAR I. INSPECTION REPORT NO. 050-367/73-01.
6 Apr 73, 13p

Descriptors: (*Bailly-1 reactor, *Inspection), Quality assurance, Reactor licensing.

For abstract, see NSA 28 02, number 04907.

DOCKET-50367-39/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
BAILLY GENERATING STATION, NUCLEAR I. VENDOR INSPECTION REPORT NO. 999-036/73-01.
2 Apr 73, 8p

Descriptors: (*Bailly-1 reactor, *Inspection), Pressure vessels, Reactor licensing.

For abstract, see NSA 28 02, number 04908.

DOCKET-50367-40/GA PC$3.00/MF$1.45
Northern Indiana Public Service CO., Hammond.
BAILLY GENERATING STATION, NUCLEAR 1. LOAD AND CAPACITY REPORT.
8 May 73, 2p

Descriptors: (*Bailly-1 reactor, *Reactor operation), Electric power, Reactor licensing.

For abstract, see NSA 28 03, number 07593.

DOCKET-50369-39/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
MCGUIRE NUCLEAR STATION, UNIT 1. VENDOR INSPECTION REPORT NO. 999-36/73-02.
28 Mar 73, 14p

Descriptors: (*Mc guire-1 reactor, *Inspection), Fabrication, Pressure vessels, Reactor licensing.

For abstract, see NSA 28 02, number 04909.

DOCKET-50369-40/GA PC$3.25/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2. INSPECTION REPORTS NOS. 50-369/73-1 AND 50-370/73-1.
27 Apr 73, 24p DOCKET-50370-39

Descriptors: (*Mc guire-1 reactor, *Inspection), (*Mc guire-2 reactor, Inspection), Fabrication, Reactor licensing.

For abstract, see NSA 28 03, number 07594.

DOCKET-50374-34/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
LA SALLE COUNTY STATION, UNIT 2. VENDOR INSPECTION REPORT NO. 999-035/73-03.
13 Apr 73, 10p

Descriptors: (*La salle county-2 reactor, *Inspection), Fabrication, Pressure vessels, Reactor licensing.

For abstract, see NSA 28 02, number 04910.

DOCKET-50382-59/GA PC$3.00/MF$1.45
Department of the Interior, Washington, D.C. (Usa).
WATERFORD STEAM ELECTRIC STATION, UNIT 3. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF THE UNITED STATES DEPARTMENT OF THE INTERIOR.
23 Apr 73, 6p

Descriptors: (*Waterford-3 reactor, *Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04911.

DOCKET-50382-60/GA PC$3.00/MF$1.45
Louisiana Power and Light CO., New Orleans.
WATERFORD STEAM ELECTRIC STATION, UNIT 3. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 34.
26 Apr 73, 15p

Descriptors: (*Waterford-3 reactor, *Reactor safety), Containment, Cooling, Loss of coolant, Reactor components, Reactor cooling systems, Reactor licensing.

For abstract, see NSA 28 02, number 04912.

DOCKET-50382-61/GA PC$3.00/MF$1.45
Louisiana Power and Light CO., New Orleans.
WATERFORD STEAM ELECTRIC STATION, UNIT 3. EMERGENCY CORE COOLING SYSTEM IMPROVEMENT REPORT.
30 Apr 73, 2p

Descriptors: (*Waterford-3 reactor, *Eccs), Configuration, Performance, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04913.

DOCKET-50382-62/GA PC$3.00/MF$1.45
Louisiana Power and Light CO., New Orleans.

WATERFORD STEAM ELECTRIC STATION, UNIT 3. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 35.
15 May 73, 17p

Descriptors: (*Waterford-3 reactor, *Containment shells), Heat transfer, Reactor accidents, Reactor licensing.

For abstract, see NSA 28 02, number 04914.

DOCKET-50387-33/GA PC$3.00/MF$1.45
Pennsylvania Power and Light CO., Allentown.
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, RESPONSES TO GOVERNMENT AGENCY COMMENTS.
12 Apr 73, 8p DOCKET-50388-32

Descriptors: (*Susquehanna-1 reactor, *Environment), (*Susquehanna-2 reactor, Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04915.

DOCKET-50387-34/GA PC$3.00/MF$1.45
Pennsylvania Power and Light CO., Allentown.
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 10.
May 73, 12p DOCKET-50388-33

Descriptors: (*Susquehanna-1 reactor, *Pipelines), (*Susquehanna-2 reactor, Pipelines), Configuration, Containment shells, Failures, Reactor licensing.

For abstract, see NSA 28 02, number 04916.

DOCKET-50387-35/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2. VENDOR INSPECTION REPORT NO. 999-635/73-02.
27 Mar 73, 11p DOCKET-50388-34

Descriptors: (*Susquehanna-1 reactor, *Inspection), (*Susquehanna-2 reactor, Inspection), Fabrication, Pressure vessels, Reactor licensing.

For abstract, see NSA 28 02, number 04917.

DOCKET-50387-37/GA PC$3.00/MF$1.45
Department of the Interior, Washington, D.C. (Usa).
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF UNITED STATES DEPARTMENT OF THE INTERIOR.
4 May 73, 6p DOCKET-50388-36

Descriptors: (*Susquehanna-1 reactor, *Environment), (*Susquehanna-2 reactor, Environment), Reactor licensing, Reactor operation, Reactor sites.

For abstract, see NSA 28 02, number 04918.

DOCKET-50387-38/GA PC$3.00/MF$1.45
Pennsylvania Power and Light CO., Allentown.
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2. CONTROL OF GASEOUS IODINE RELEASES.
11 May 73, 1p DOCKET-50388-37

Descriptors: (*Susquehanna-1 reactor, *Iodine), (*Susquehanna-2 reactor, Iodine), Environment, Gaseous wastes, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07595.

DOCKET-50389-11/GA PC$26.00/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 1.
15 May 73, 477p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Configuration, Reactor licensing, Reactor sites, Specifications.

For abstract, see NSA 28 02, number 04919.

DOCKET-50389-12/GA PC$23.00/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 2.
21 May 73, 416p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Configuration, Mechanical structures, Reactor licensing.

For abstract, see NSA 28 02, number 04920.

DOCKET-50389-13/GA PC$20.75/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 3.
21 May 73, 372p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Reactor cooling systems, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04921.

DOCKET-50389-14/GA PC$30.50/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 4.
21 May 73, 566p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Equipment protection devices, Reactor control systems, Reactor instrumentation, Reactor licensing.

For abstract, see NSA 28 02, number 04922.

DOCKET-50389-15/GA PC$21.25/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 5.
21 May 73, 384p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Electric power, Electrical equipment, Reactor licensing.

For abstract, see NSA 28 02, number 04923.

DOCKET-50389-16/GA PC$15.75/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 6.
21 May 73, 274p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Radiation protection, Radioactive waste disposal, Reactor licensing, Steam generators, Steam turbines.

For abstract, see NSA 28 02, number 04924.

DOCKET-50389-17/GA PC$19.50/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 7.
21 May 73, 349p

Descriptors: (*Lucie-2 reactor, *Reactor safety), Reactor accidents, Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 02, number 04925.

DOCKET-50390-37/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2. FAULTY OVERCURRENT TRIP DELAY DEVICE IN CIRCUIT BREAKERS FOR ENGINEERED SAFETY SYSTEMS.
21 Feb 73, 6p DOCKET-50391-37

Descriptors: (*Watts bar-1 reactor, *Equipment protection devices), (*Watts bar-2 reactor, Equipment protection devices), Circuit breakers, Reactor licensing, Specifications.

For abstract, see NSA 28 02, number 04926.

DOCKET-50400-42/GA PC$13.50/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 1, 2, 3, AND 4. SAFETY EVALUATION WITH SUPPLEMENT NO. 1.
27 Apr 73, 229p DOCKET-50401-42, DOCKET-50402-42

Descriptors: (*Harris-1 reactor, *Reactor safety), (*Harris-2 reactor, Reactor safety), (*Harris-3 reactor, Reactor safety), (*Harris-4 reactor, Reactor safety), Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07596.

DOCKET-50400-43/GA PC$18.50/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 1, 2, 3, AND 4. FINAL ENVIRONMENTAL STATEMENT.
May 73, 330p DOCKET-50401-43, DOCKET-50402-43

Descriptors: (*Harris-1 reactor, *Environment), (*Harris-2 reactor, Environment), (*Harris-3 reactor, Environment), (*Harris-4 reactor, Environment), Cost benefit analysis, Geology, Radioactive wastes, Reactor licensing, Reactor operation, Reactor sites, Thermal effluents.

For abstract, see NSA 28 03, number 07597.

DOCKET-50404-50/GA PC$9.75/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 3 AND 4. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 16.
4 May 73, 154p DOCKET-50405-49

Descriptors: (*North anna-3 reactor, *Reactor safety), (*North anna-4 reactor, Reactor safety), Containment systems, Radiation monitoring, Radioactive wastes, Reactor licensing.

For abstract, see NSA 28 03, number 07598.

DOCKET-50404-51/GA PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond.
NORTH ANNA POWER STATION, UNITS 3 AND 4. PLANNED RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE PLAN.
4 May 73, 6p DOCKET-50405-50

Descriptors: (*North anna-3 reactor, *Radiation monitoring), (*North anna-4 reactor, Radiation monitoring), Environment, Reactor licensing.

For abstract, see NSA 28 03, number 07599.

DOCKET-50409-46/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
LA CROSSE BOILING WATER REACTOR. TECHNICAL SPECIFICATIONS, CHANGE 10.
26 Mar 73, 2p

Descriptors: (*Lacbwr reactor, *Reactor cooling systems), Control systems, Reactor licensing, Specifications, Testing, Valves.

For abstract, see NSA 28 03, number 07600.

DOCKET-50409-47/GA PC$3.00/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis.
LA CROSSE BOILING WATER REACTOR. WESTINGHOUSE CIRCUIT BREAKERS.
29 Mar 73, 1p

Descriptors: (*Lacbwr reactor, *Circuit breakers), Equipment protection devices, Reactor licensing.

For abstract, see NSA 28 03, number 07601.

DOCKET-50409-48/GA PC$3.00/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis.
LA CROSSE BOILING WATER REACTOR. ABNORMAL REACTOR VESSEL HEATUP RATE.
21 Mar 73, 18p

Descriptors: (*Lacbwr reactor, *Pressure vessels), Heating, Primary coolant circuits, Reactor licensing, Reactor operation.

For abstract, see NSA 28 03, number 07602.

DOCKET-50409-49/GA PC$3.00/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis.
LA CROSSE BOILING WATER REACTOR. HIGH PRESSURE EMERGENCY CORE SPRAY SYSTEM (ECCS) PIPE FITTING LEAKAGE.
1 May 73, 4p

Descriptors: (*Lacbwr reactor, *Eccs), Leaks, Pipelines, Reactor licensing.

For abstract, see NSA 28 03, number 07603.

DOCKET-50409-50/GA PC$3.00/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis.
LA CROSSE BOILING WATER REACTOR. REFUELING PLAN.
4 May 73, 13p DPC-851-56

Descriptors: (*Lacbwr reactor, *Reactor fueling), Fuel elements, Inspection, Planning, Reactor licensing, Reactor maintenance, Reactor shutdown.

For abstract, see NSA 28 03, number 07604.

DOCKET-50409-51/GA PC$3.50/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis.
LA CROSSE BOILING WATER REACTOR. MONTHLY OPERATING REPORT FOR FEBRUARY 1973.
1973, 28p DPC-851-55
Contract AT(11-1)-851

Descriptors: (*Lacbwr reactor, *Reactor operation), Diesel engines, Reactor licensing, Reactor shutdown, Testing.

For abstract, see NSA 28 03, number 07605.

DOCKET-50410-28/GA PC$3.00/MF$1.45
Department of the Interior, Washington, D.C. (Usa).
NINE MILE POINT NUCLEAR STATION, UNIT 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF UNITED STATES DEPARTMENT OF THE INTERIOR.
23 Apr 73, 6p

Descriptors: (*Nine mile point-2 reactor, *Environment), Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04927.

DOCKET-50412-8/GA PC$3.00/MF$1.45
Department of Justice, Washington, D.C. Antitrust Div.
BEAVER VALLEY POWER STATION, UNIT 2. DEPARTMENT OF JUSTICE ADVISES ANTITRUST HEARING NOT REQUIRED.
20 Apr 73, 8p

Descriptors: (*Beaver valley-2 reactor, *Legal aspects), Reactor licensing.

For abstract, see NSA 28 02, number 04928.

DOCKET-50412-9/GA PC$32.25/MF$1.45
Duquesne Light CO., Pittsburgh, PA.
BEAVER VALLEY POWER STATION, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 4.
27 Apr 73, 602p

Descriptors: (*Beaver valley-2 reactor, *Reactor safety), Reactor cooling systems, Reactor instrumentation, Reactor licensing, Reactor sites, Safety engineering.

For abstract, see NSA 28 02, number 04929.

DOCKET-50413-15/GA PC$17.50/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT.
Apr 73, 308p DOCKET-50414-15

Descriptors: (*Catawba-1 reactor, *Environment), (*Catawba-2 reactor, Environment), Cost benefit analysis, Reactor licensing, Reactor operation.

For abstract, see NSA 28 02, number 04930.

DOCKET-50413-16/GA PC$3.00/MF$1.45
Department of Justice, Washington, D.C. Antitrust Div.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. DEPARTMENT OF JUSTICE RECOMMENDATION OF AN ANTITRUST HEARING.
1 May 73, 2p DOCKET-50414-16

Descriptors: (*Catawba-1 reactor, *Legal aspects), (*Catawba-2 reactor, Legal aspects), Reactor licensing.

For abstract, see NSA 28 02, number 04931.

DOCKET-50413-17/GA PC$18.25/MF$1.45
Duke Power CO., Charlotte, N.C.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 7.
4 May 73, 324p DOCKET-50414-17

Descriptors: (*Catawba-1 reactor, *Reactor safety), (*Catawba-2 reactor, Reactor safety), Electrical equipment, Mechanical structures, Radioactive waste disposal, Reactor instrumentation, Reactor licensing, Steam generators.

For abstract, see NSA 28 02, number 04932.

DOCKET-50413-18/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region II.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. INSPECTION REPORTS NOS. 50-413/73-1 AND 50-414/73-1.
27 Apr 73, 20p DOCKET-50414-18

Descriptors: (*Catawba-1 reactor, *Inspection), (*Catawba-2 reactor, Inspection), Quality assurance, Reactor licensing.

For abstract, see NSA 28 02, number 04933.

DOCKET-50413-19/GA PC$3.00/MF$1.45
Advisory Council on Historic Preservation, Washington, D.C. (Usa).
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF ADVISORY COUNCIL ON HISTORIC PRESERVATION.
4 May 73, 1p DOCKET-50414-19

Descriptors: (*Catawba-1 reactor, *Environment), (*Catawba-2 reactor, Environment), Reactor licensing, Reactor sites.

For abstract, see NSA 28 03, number 07606.

DOCKET-50413-20/GA PC$20.50/MF$1.45
Duke Power CO., Charlotte, N.C.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 8.
15 May 73, 366p DOCKET-50414-20

Descriptors: (*Catawba-1 reactor, *Containment systems), (*Catawba-2 reactor, Containment systems), Containment buildings, Ice, Performance, Reactor licensing, Reactor safety.

For abstract, see NSA 28 03, number 07607.

DOCKET-50416-22/GA PC$60.00/MF$1.45
Mississippi Power and Light CO., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 4.
20 Apr 73, 1374p DOCKET-50417-22

Descriptors: (*Grand gulf-1 reactor, *Reactor safety), (*Grand gulf-2 reactor, Reactor safety), Containment shells, Control systems, Reactor instrumentation, Reactor licensing, Reactor operation, Reactor sites, Safety engineering.

For abstract, see NSA 28 02, number 04934.

DOCKET-50416-23/GA PC$24.75/MF$1.45
Mississippi Power and Light CO., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 6.
30 Apr 73, 452p DOCKET-50417-23

Descriptors: (*Grand gulf-1 reactor, *Reactor safety), (*Grand gulf-2 reactor, Reactor safety), Containment shells, Failures, Pipes, Reactor accidents, Reactor licensing, Steam turbines, Stress analysis.

For abstract, see NSA 28 02, number 04935.

DOCKET-50416-24/GA PC$3.00/MF$1.45
Mississippi Power and Light CO., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. AEC PRESS RELEASE CONCERNING STANDARDIZATION.
10 May 73, 2p DOCKET-50417-24

Descriptors: (*Grand gulf-1 reactor, *Power), (*Grand gulf-2 reactor, Power), Legal aspects, Reactor licensing.

For abstract, see NSA 28 03, number 07608.

DOCKET-50424-12/GA PC$4.50/MF$1.45
Georgia Power CO., Atlanta.
ALVIN W. VOGTLE NUCLEAR PLANT, UNITS 1, 2, 3, AND 4. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 1.
27 Apr 73, 47p DOCKET-50425-12, DOCKET-50426-12

Descriptors: (*Vogtle-1 reactor, *Equipment protection devices), (*Vogtle-2 reactor, Equipment protection devices), (*Vogtle-3 reactor, Equipment protection devices), (*Vogtle-4 reactor, Equipment protection devices), Configuration, Reactor cooling systems, Reactor licensing.

For abstract, see NSA 28 02, number 04936.

DOCKET-50424-14/GA PC$3.00/MF$1.45
Department of Justice, Washington, D.C. Antitrust Div.

ALVIN W. VOGTLE NUCLEAR PLANT, UNITS 1, 2, 3, AND 4. DEPARTMENT OF JUSTICE RECOMMENDATION WITH RESPECT TO ANTITRUST HEARING.
9 May 73, 2p DOCKET-50425-14, DOCKET-50426-14

Descriptors: (*Vogtle-1 reactor, *Legal aspects), (*Vogtle-2 reactor, Legal aspects), (*Vogtle-3 reactor, Legal aspects), (*Vogtle-4 reactor, Legal aspects), Reactor licensing.

For abstract, see NSA 28 02, number 04937.

EUR-4924/GA PC$7.25/MF$1.45
Ente Nazionale Per l'Energia Elettrica, Rome (Italy).
GARIGLIANO NUCLEAR POWER PLANT. ANNUAL REPORT, 1971.
Mar 73, 104p
In Italian. U.S. Sales Only.

Descriptors: (*Garigliano reactor, *Reactor maintenance), Burnup, Electric power, Failures, Performance, Reactor components, Reactor cores, Reactor operation, Reactor shutdown, Repair.

For abstract, see NSA 28 02, number 04484.

FIND-50298-R1/GA PC$4.00/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
FIND: COOPER NUCLEAR STATION.
H. D. Raleigh. 10 Apr 73, 32p

Descriptors: (*Cooper reactor, *Reactor safety), Indexes, Reactor licensing.

For abstract, see NSA 28 02, number 04485.

FIND-50317-R1/GA PC$4.00/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
FIND: CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2.
H. D. Raleigh. 9 May 73, 33p FIND-50318-R1

Descriptors: (*Calvert cliffs-1 reactor, *Reactor safety), (*Calvert cliffs-2 reactor, Reactor safety), Indexes, Reactor licensing.

For abstract, see NSA 28 02, number 04583.

HEDL-TME-73-24/GA PC$7.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
REVIEW OF THERMAL POWER PLANT INTAKE STRUCTURE DESIGNS AND RELATED ENVIRONMENTAL CONSIDERATIONS.
J. C. Jr. Sonnichsen, B. W. Bentley, G. F. Bailey, and R. E. Nakatani. May 73, 102p
Contract AT(45-1)-2170

Descriptors: (*Nuclear power plants, *Environment), (*Power plants, Environment), Cooling, Design, Lakes, Mechanical structures, Rivers, Steam condensers, Water.

For abstract, see NSA 28 02, number 04587.

JPRS-60000/GA PC$5.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
CHARACTERISTICS OF THE ELECTRICAL PART OF ATOMIC-ELECTRIC PLANTS,
M. L. Feldman, and A. K. Chernovets. 11 Sep 73, 206p
Trans. of mono. Osobennosti Elektricheskoi Chasti Atomnykh Elektrostantsii, Leningrad, 1972 168p.

Descriptors: (*Nuclear power plants, Electrical engineering), Circuits, Power supplies, Electric equipment, Translations, USSR.

The report contains a description of the main characteristics of the electrical part of large modern atomic stations and their differences from the electrical part of thermal electric power plants using organic fuel. A brief characterization of the technological diagrams of promising types of nuclear plants is given. Reliability of the power supply for mechanisms is discussed.

JUL-920-RG/GA PC$10.00/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorentwicklung.
COST ANALYSIS OF COMPONENTS FOR NUCLEAR POWER PLANTS WITH HIGH-TEMPERATURE REACTOR AND GAS-TURBINE.
H. V. Schlenker. Feb 73, 157p
In German. U.S. Sales Only.

Descriptors: (*Htgr type reactors, *Direct cycle cooling systems), (*Gas turbines, *Cost), (*Turbogenerators, Cost), (*Heat exchangers, Cost), Cooling towers, Ducts, Helium, Nuclear power plants, Pressure vessels, Prestressed concrete.

For abstract, see NSA 28 03, number 07296.

N73-28653/6GA PC$9.50/MF$1.45
Georgia Inst. of Tech., Atlanta.
SATELLITE NUCLEAR POWER STATION: AN ENGINEERING ANALYSIS.
Mar 73, 147p NASA-CR-121254
Contract NGR-11-002-145

Descriptors: *Nuclear power plants, *Space stations, Energy transfer, Microwaves, Remote control.

For abstract, see STAR 1119

ORNL-4809/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
CONCEPT: COMPUTERIZED CONCEPTUAL COST ESTIMATES FOR STEAM-ELECTRIC POWER PLANTS. PHASE II USER'S MANUAL.
H. I. Bowers, L. D. Reynolds, R. C. DeLozier, and B. E. Srite. Apr 73, 216p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *C codes), (*Nuclear power plants, *Cost), (*Power plants, Cost), Bwr type reactors, Capital, Coal, Economics, Electric power, Petroleum, Pwr type reactors.

For abstract, see NSA 28 02, number 04656.

TID-26317/GA PC$7.25/MF$1.45
Ente Nazionale Per l'Energia Elettrica, Rome (Italy).
GARIGLIANO NUCLEAR POWER PLANT. ANNUAL REPORT, 1971.
Jun 72, 103p

Descriptors: (*Garigliano reactor, *Reactor operation), Fuel cycle, Radiation monitoring, Radioactive wastes, Reactor maintenance.

For abstract, see NSA 28 03, number 07261.

WCAP-8014/GA PC$3.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Nuclear Energy Systems Div.
DIGITAL ROD POSITION INDICATION.
A. E. Blanchard, and J. E. Calpin. Dec 72, 25p

Descriptors: (*Pwr type reactors, Control elements), (*Control elements, *Displacement gages), Data display systems, Design, Digital systems, Electronic circuits, On-line control systems.

For abstract, see NSA 28 02, number 04652.

WCAP-8110/GA PC$8.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA.
TEST PLANS AND RESULTS FOR THE ICE CONDENSER SYSTEM.
16 Apr 73, 124p

Descriptors: (*Pwr type reactors, Containment), (*Containment, *Testing), Equipment protection devices, Ice, Mockup, Reactor components, Reactor licensing, Reactor safety, Safety engineering, Seismic effects, Stresses.

For abstract, see NSA 28 02, number 04593.

18F. Radiation Shielding and Protection

CEA-CONF-2191/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
PARTICULAR PROPERTIES OF PROTECTIVE CONCRETE INFLUENCING THE ATTENUATION PROCESS OF RADIATIONS.
F. Dubois. 19p CONF-721018-19
In French. U.S. Sales Only.

Descriptors: (*Concretes, *Shielding), Attenuation, Chemical composition, Radiations, Reactors, Thickness.

For abstract, see NSA 28 02, number 04443.

CEA-CONF-2213/GA PC$3.75/MF$1.45
Commissariat a l'Energie Atomique, Paris (France). Electricite de France, Paris.
COMPUTATIONAL METHODS FOR GRAPHITE GAS COOLED REACTORS SHIELDING: COMPARISON WITH SHIELDING MEASUREMENTS MADE DURING START-UP TESTS.
J. Brisbois, J. Duco, F. Bourdeau, and J. Chapus. 33p CONF-721018-10
In French. U.S. Sales Only.

Descriptors: (*Saint laurent-1 reactor, *Shielding), (*Saint laurent-2 reactor, Shielding), (*Bugey-1 reactor, Shielding), (*Gcr type reactors, Shielding), Biological shields, Computer calculations, Gamma radiation, In-vessel heat exchangers, Integrated cooling systems, Mockup, Monte carlo method, Neutron beams, Photon beams, Primary coolant circuits, Radiation doses, Reactor cores, Reactor shutdown, Reactor start-up, Supports.

For abstract, see NSA 28 02, number 04500.

CEA-CONF-2218/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
MONTE CARLO PROGRAM IN THREE-DIMENSIONAL GEOMETRY: TRIPOLI.
L. Bourdet, S. Katz, J. C. Nimal, and T. Vergnaud. 1972, 17p CONF-721018-11
In French. U.S. Sales Only.

Descriptors: (*Computer codes, *T codes), (*Neutron flux, *Energy spectra), (*Shielding, *Three-dimensional calculations), Monte carlo method, Multigroup theory, Performance, Shielding materials, Spatial distribution.

For abstract, see NSA 28 03, number 07437.

CONF-721018-23/GA PC$3.00/MF$1.45
Ship Research Inst., Tokyo (Japan).
SHIELDING OPTIMIZATION BY DIFFERENTIAL DYNAMIC PROGRAMMING METHOD AND EXPERIMENT.
Y. Kanai, A. Yamaji, and K. Takeuchi. 1972, 14p
U.S. Sales Only.

Descriptors: (*Shielding, *Configuration), (*Gamma radiation, *Attenuation), (*Neutrons, Attenuation), Biological shields, Cost, Dynamic programming, Iron, Multigroup theory, Neutron

beams, Nuclear ships, Photon beams, Radiation doses, S codes, Shielding materials, Thickness, Water, Weight.

For abstract, see NSA 28 02, number 04444.

CONF-730518-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
HALF-VALUE THICKNESS MEASUREMENTS OF ORDINARY CONCRETE FOR NEUTRONS FROM CYCLOTRON TARGETS.
H. M. Butler, K. M. Wallace, and C. B. Fulmer. 1973, 12p

Descriptors: (*Cyclotrons, *Shielding), (*Concretes, *Neutron transport), (*Neutrons, *Half-thickness), Neutron beams, Ornl isochronous cyclotron, Targets.

For abstract, see NSA 28 03, number 06496.

GEAP-13822-4/GA PC$5.45/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
LMFBR SHIELDING DESIGN EXPERIMENTS AND METHODS EVALUATION. FOURTH QUARTERLY REPORT, OCTOBER--DECEMBER 1972.
Jan 73, 90p
Contract AT(04-3)-189

Descriptors: (*Fbr type reactors, Shielding), (*Sodium cooled reactors, Shielding), (*Shielding, *Research programs), Boron carbides, Computer calculations, Configuration, Fast neutrons, Neutron flux.

For abstract, see NSA 28 03, number 07332.

HASL-272/GA PC$4.00/MF$1.45
Health and Safety Lab. (Aec), New York.
TRANSMISSION OF GAMMA RAYS THROUGH ALUMINUM AND LAMINATED LEAD--ALUMINUM SLABS.
G. de P. Burke, B. G. Bennett, and H. L. Beck. Mar 73, 18p

Descriptors: (*Gamma radiation, *Transmission), (*Aluminium, *Photon transport), (*Lead, Photon transport), Angular distribution, Gamma spectra, Monte carlo method, Slabs, Spectrometers.

For abstract, see NSA 28 02, number 04445.

K-TL-273/GA PC$3.00/MF$1.45
Oak Ridge Gaseous Diffusion Plant, Tenn.
COMPARISON OF CONCRETE- AND WATER-REFLECTED URANIUM HEXAFLUORIDE SYSTEMS.
C. E. Newlon. 10 Nov 72, 18p
Contract W-7405-eng-26

Descriptors: (*Uranium hexafluoride, *Criticality), A codes, Computer calculations, Concretes, Cylinders, Neutron reflectors, Storage, Water.

For abstract, see NSA 28 02, number 03455.

N-73-12700/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
SHIELDING APPLICATION OF PERTURBATION THEORY TO DETERMINE CHANGES IN NEUTRON AND GAMMA DOSES DUE TO CHANGES IN SHIELD LAYERS.
D. Fieno. Nov 72, 44p NASA-TN-D-7093

Descriptors: (*Gamma radiation, *Radiation doses), (*Neutrons, Radiation doses), (*Shielding, *Perturbation theory), Layers.

For abstract, see NSA 28 02, number 04446.

N73-27579/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DOPEX-1D2C: A ONE-DIMENSIONAL, TWO-CONSTRAINT RADIATION SHIELD OPTIMIZATION CODE.
G. P. Lahti. Jul 73, 31p NASA-TM-X-2836, E-7421

Descriptors: *Computer programs, *Optimization, *Radiation shielding, *Steepest descent method, Codes, Fortran, Weight (Mass).

For abstract, see STAR 1118

N73-27580/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SHIELD MATERIALS RECOMMENDED FOR SPACE POWER NUCLEAR REACTORS.
L. J. Kaszubinski. Jul 73, 36p NASA-TM-X-2835, E-7347

Descriptors: *Lithium hydrides, *Radiation shielding, *Space power unit reactors, *Uranium alloys, Reactor design, Reactor materials, Tungsten alloys.

For abstract, see STAR 1118

ORNL-RSIC-31(Vol.1)/GA PC$7.50/MF$1.45
Oak Ridge National Lab., Tenn.
ABSTRACTS OF PERIPHERAL SHIELDING CODE PACKAGES ASSEMBLED BY THE RADIATION SHIELDING INFORMATION CENTER.
B. F. Maskewitz. 108p

Descriptors: (*Shielding, *Computer codes), Documentation, Information.

For abstract, see NSA 28 03, number 07209.

RT/FIMA-(72)8/GA PC$5.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ATTOW-B: A NEW VERSION OF REMOVAL DIFFUSION SHIELDING CODE ATTOW.
A. Daneri, L. Martelli, and G. Toselli. 21 Dec 72, 73p
U.S. Sales Only.

Descriptors: (*Computer codes, *A codes), Ibm computers, Neutron transport theory, Shielding.

For abstract, see NSA 28 03, number 07210.

SLA-73-184/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
REDUCTION OF NEUTRON DAMAGE IN SILICON BY THICK SHIELDS OF IRON, TUNGSTEN, AND POLYETHYLENE.
R. I. Ewing, J. H. Renken, and K. G. Adams. Mar 73, 12p

Descriptors: (*Iron, *Shielding), (*Tungsten, Shielding), (*Polyethylenes, Shielding), (*Silicon, *Physical radiation effects), Mev range 01-10, Neutron transport, Neutrons, Thickness.

For abstract, see NSA 28 02, number 04447.

TID-25951/GA PC$13.60/MF$1.45
Radiation Research Associates, Inc., Fort Worth, Tex.
REACTOR SHIELDING FOR NUCLEAR ENGINEERS.
N. M. Schaeffer. 1973, 801p

Descriptors: (*Reactors, *Shielding), Education, Gamma transport theory, Neutron transport theory, Shielding materials.

For abstract, see NSA 28 03, number 07449.

ZJE-127/GA PC$6.00/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
SOLUTION OF RADIATION TRANSPORT IN SHIELDING BY THE ANALYTICAL METHOD USING FUNCTIONS OF MATRIX ARGUMENT.
V. Valenta. 1972, 79p
U.S. Sales Only.

Descriptors: (*Shielding, *Neutron transport theory), Analytical solution, Carlson method, Discrete ordinates, Gamma radiation, Matrices, Photon transport, Reflection, Reflection, Slabs, Transmission.

For abstract, see NSA 28 02, number 04448.

ZJE-133/GA PC$8.75/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
USING THE METHOD OF SPHERICAL HARMONICS FOR THE CALCULATION OF SHIELDING. PART 2. THE 2P/SUB N/ APPROXIMATION.
J. Hep, and V. Valenta. 1972, 131p
U.S. Sales Only.

Descriptors: (*Shielding, *Spherical harmonics method), Analytical solution, Polynomials, P1-approximation, P2-approximation, P3-approximation, Series expansion.

For abstract, see NSA 28 02, number 04449.

ZJE-134/GA PC$6.00/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
USING THE METHOD OF SPHERICAL HARMONICS FOR THE CALCULATION OF SHIELDING. PART 3. GENERALIZED P/SUB N/ APPROXIMATION.
V. Valenta, and O. Veverka. 1972, 76p
U.S. Sales Only.

Descriptors: (*Shielding, *Spherical harmonics method), Boundary conditions, Geometry, Plates, Radiation sources.

For abstract, see NSA 28 02, number 04450.

18G. Radioactive Wastes and Fission Products

AERE-M-2143/GA PC$4.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
BITUMEN INCORPORATION: A.E.R.E. OPERATIONAL EXPERIENCES.
R. H. Burns, and G. W. Clare. Nov 68, 36p CONF-681226-2
U.S. Sales Only.

Descriptors: (*Radioactive waste processing, *Solidification), Bitumens, Economics.

For abstract, see NSA 28 03, number 05406.

AERE-M-2223/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
LEACHING OF RADIOACTIVE SLUDGES INCORPORATED IN CEMENT AND BITUMEN.
A. J. Smith. May 69, 16p
U.S. Sales Only.

Descriptors: (*Bitumens, *Leaching), (*Cements, Leaching), (*Radioactive wastes, Leaching), Slurries.

For abstract, see NSA 28 02, number 02445.

BNWL-CC-1695/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.

EVALUATION OF STRONTIUM AND CESIUM COMPOUNDS FOR WASTE PACKAGING.
T. S. Soine, and H. T. Fullam. 26 Jun 68, 20p

Descriptors: (*Radioactive waste processing, *Liquid wastes), (*Strontium 90, Radioactive waste processing), (*Cesium 137, Radioactive waste processing), (*Cesium chlorides, Radioactive waste processing), Cesium compounds, Packaging, Radioactive waste disposal, Solidification, Strontium fluorides, Strontium phosphates, Uranates, Waste storage.

For abstract, see NSA 28 02, number 02446.

BNWL-1464/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
REVIEW OF STUDIES ON SOIL--WASTE RELATIONSHIPS ON THE HANFORD RESERVATION FROM 1944--1967.
R. C. Routson. Mar 73, 63p
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Radioactive waste disposal), (*Soils, *Sorptive properties), Adsorption, Cesium 137, Cobalt 60, Columbia river, Depth, Diffusion, Ground water, Liquid wastes, Plutonium, Radiation monitoring, Radioisotopes, Radionuclide migration, Rare earths, Ruthenium 106, Strontium 90, Transition elements, Tritium, Underground disposal.

For abstract, see NSA 28 02, number 02559.

BNWL-1730/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
FRACTIONAL AIRBORNE RELEASE OF URANIUM (REPRESENTING PLUTONIUM) DURING THE BURNING OF CONTAMINATED WASTES.
J. Mishima, and L. C. Schwendiman. Apr 73, 20p
Contract AT(45-1)-1830

Descriptors: (*Plutonium, *Fire hazards), (*Fuel reprocessing plants, Fire hazards), (*Radioactive wastes, *Combustion), Buildings, Containment, Contamination, Diffusion, Environment, Simulators, Solid wastes, Uranium, Uranium dioxide, Uranium nitrates.

For abstract, see NSA 28 02, number 02560.

CEA-CONF-2096/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
TECHNIQUE OF EXAMINATION AT A DISTANCE IN PREPARATION FOR THE STUDY OF FISSION PRODUCT BEHAVIOR.
N. Vignesoult, J. Bazin, J. Monier, and G. de Contenson. 1971, 30p CONF-720903-15
In French. U.S. Sales Only.

Descriptors: (*Fuel elements, *Fission products), (*Gamma spectroscopy, Fission products), (*Microscopy, Fission products), (*Autoradiography, Fission products), Burnup, Ceramics, Distribution, Fuel cans, Measuring methods, Microanalysis, Microstructure, Remote handling.

For abstract, see NSA 28 02, number 03017.

CEA-CONF-2214/GA PC$3.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
CALCULATION OF THE CIRCUITS ACTIVITY IN A HIGH TEMPERATURE REACTOR.
J. Brisbois, P. Beslu, and A. L'homme. 31p
In French. U.S. Sales Only.

Descriptors: (*Fission products, Primary coolant circuits), (*Htgr type reactors, Primary coolant circuits), (*Primary coolant circuits, *Contamination), (*Heat exchangers, Contamination), Coated fuel particles, Diffusion, Physical radiation effects, Pyrolytic carbon, Silicon carbides.

For abstract, see NSA 28 03, number 07285.

CEA-CONF-2225/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Paris (France).
INTERNATIONAL WASTE MANAGEMENT EXPERIENCES AND PLANS.
Y. Sousselier. Oct 72, 16p CONF-721109-20
U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *International cooperation).

For abstract, see NSA 28 02, number 03448.

CEA-R-4444/GA PC$7.50/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
COATING OF ALUMINUM RESIDUES CONTAINING FISSION PRODUCT FLUORIDES.
P. Labe. Apr 73, 109p
In French. U.S. Sales Only.

Descriptors: (*Radioactive waste processing, *Vitrification), Aluminium oxides, Fission products, Fluoride volatility process, Fluorides, Glass, Solid wastes, Volatility.

For abstract, see NSA 28 03, number 05408.

CONF-721107-6/GA PC$3.50/MF$1.45
Allied Chemical Corp., Idaho Falls, Idaho.
SOLIDIFICATION OF HIGH-LEVEL RADIOACTIVE WASTES AT THE IDAHO CHEMICAL PROCESSING PLANT.
L. T. Lakey, and B. R. Wheeler. 27p

Descriptors: (*Radioactive waste processing, *Solidification), Calcination, Efficiency, Fuel reprocessing plants, Liquid wastes.

For abstract, see NSA 28 02, number 02449.

FRNC-CONF-33/GA PC$3.00/MF$1.45
Pechiney Ugine Kuhlmann, Paris (France).
RADIOACTIVE WASTE DECONTAMINATION.
J. M. Blum, J. J. Jaumier, and J. L. Verot. 1972, 5p CONF-720454-2
In French. U.S. Sales Only.

Descriptors: (*Radioactive waste processing, *Liquid wastes), (*Ruthenium, *Separation processes), Adsorption, Decontamination, Iron, Precipitation, Ruthenium 106, Cesium 137, Ion exchange, Spent fuel storage, Water, Zeolites.

For abstract, see NSA 28 03, number 05409.

HEDL-TME-73-22/GA PC$5.45/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
TREATMENT OF LOW-LEVEL, ALPHA-CONTAMINATED SOLID WASTE BY ACID DIGESTION.
R. E. Lerch, and C. R. Cooley. Apr 73, 52p
Contract AT(45-1)-2170

Descriptors: (*Radioactive waste processing, *Solid wastes), Alpha sources, Ion exchange materials, Latex, Neoprene, Nitric acid, Paper, Plutonium, Polyethylenes, Pvc, Radioactive wastes, Sulfuric acid.

For abstract, see NSA 28 02, number 02451.

ICP-1023/GA PC$4.00/MF$1.45
Allied Chemical Corp., Idaho Falls, Idaho. Idaho Chemical Programs Operations Office.
1972 OPERATION OF THE ICPP RARE GAS RECOVERY FACILITY.
C. L. Bendixsen, F. O. German, and R. R. Hammer. Mar 73, 24p
Contract AT(10-1)-1375

Descriptors: (*Krypton 85, *Separation processes), (*Xenon, Separation processes), (*Radioactive waste processing, *Gaseous wastes), Cryogenics, Dissolution, Distillation, Efficiency, Reprocessing, Spent fuel elements.

For abstract, see NSA 28 03, number 05418.

KFK-1585/GA PC$4.00/MF$1.45
Gesellschaft fuer Kernforschung M.B.H., Karlsruhe (West Germany). Gesellschaft fuer Strahlen- und Umweltforschung M.B.H., Munich (West Germany).
DISPOSAL OF RADIOACTIVE WASTE. ANNUAL REPORT, 1971.
W. Diefenbacher, H. Krause, M. C. Schuchardt, E. Albrecht, and H. Kolditz. Jul 72, 39p GSF-T-42
In German. U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *Salt deposits), German federal republic, Mines, Salts, Underground disposal.

For abstract, see NSA 28 03, number 06462.

N73-27943/2GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN EVALUATION OF SOME SPECIAL TECHNIQUES FOR NUCLEAR WASTE DISPOSAL IN SPACE.
J. S. Mackay. Aug 73, 25p NASA-TM-X-62272

Descriptors: *Extraterrestrial environments, *Radioactive wastes, *Thermoelectric power generation, *Waste disposal, Nuclear electric propulsion, Radioactive isotopes.

For abstract, see STAR 1119

ORNL-TM-4219/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
SITE SELECTION FACTORS FOR THE BEDDED SALT PILOT PLANT.
May 73, 23p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste disposal, *Underground disposal), Geology, Hydrology, Minerals, Salt deposits, Site selection.

For abstract, see NSA 28 02, number 03449.

ORNL-TM-4224/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
COMMERCIAL HIGH-LEVEL WASTE PROJECTIONS.
J. O. Blomeke, and J. P. Nichols. May 73, 20p
Contract W-7405-eng-26

Descriptors: (*Radioactive wastes, *Production), Solid wastes, Solidification, Usa.

For abstract, see NSA 28 02, number 03450.

ORNL-4859/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
CALCULATIONS ON THE PERFORMANCE OF THE KALC PROCESS.
M. E. Whatley. Apr 73, 95p
Contract W-7405-eng-26

Descriptors: (*Krypton, *Chemisorption), (*Radioactive waste processing, *Gaseous wastes), Carbon dioxide, Liquids, Reprocessing, Spent fuel elements.

For abstract, see NSA 28 02, number 02452.

UCRL-51350/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROCESSING OF LEACH LIQUORS PRODUCED BY NUCLEAR SOLUTION MINING.
J. D. Miller. 15 Feb 73, 20p
Contract W-7405-Eng-48

Descriptors: (*Copper, *Solvent extraction), Copper complexes, Fission products, Leaching, Nuclear explosions, Underground explosions.

For abstract, see NSA 28 03, number 05218.

WASH-1528/GA PC$8.00/MF$1.45
Atomic Energy Commission, Washington, D. C.
FUTURE HIGH LEVEL WASTE FACILITIES, SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA. ENVIRONMENTAL STATEMENT.
Apr 73, 118p

Descriptors: (*Savannah river plant, *Radioactive waste disposal), Environment, Site selection, Storage, Underground disposal.

For abstract, see NSA 28 02, number 02616.

18H. Radioactivity

BNWL-1727/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
ENVIRONMENTAL SURVEILLANCE AT HANFORD FOR CY-1972.
P. E. Bramson, and J. P. Corley. Apr 73, 76p
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Radioactivity), (*Columbia river, *Radiation monitoring), Drinking water, Earth atmosphere, Environment, Fluorides, Ground water, Nitrates, Plants, Radionuclide migration, Sampling, Soils, Surface waters.

For abstract, see NSA 28 03, number 05538.

CEA-R-4386/GA PC$7.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
LENGTH CHANGE IN PLUTONIUM AND IN SOME COMPOUNDS BY SELF-IRRADIATION AT 4.2 EXP 0 K.
J. Jacquemin. Apr 73, 96p
In French. U.S. Sales Only.

Descriptors: (*Plutonium-alpha, *Physical radiation effects), (*Plutonium-beta, Physical radiation effects), (*Plutonium-delta, Physical radiation effects), (*Plutonium nitrides, Physical radiation effects), Length, Plutonium carbides, Plutonium oxides, Ultralow temperature, Variations.

For abstract, see NSA 28 03, number 06366.

CEA-R-4443/GA PC$4.75/MF$1.45
Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.
ROLE OF THE ORGANIC MATTER OF A WATERWAY WITH REGARD TO THE RADIOACTIVE POLLUTION.
J. Faure. Mar 73, 53p
U.S. Sales Only.

Descriptors: (*Radioisotopes, *Adsorption), (*Water, *Contamination), Ion exchange materials, Organic compounds, Pollution, Sediments, Separation processes, Sodium carbonates, Sorptive properties.

For abstract, see NSA 28 03, number 05561.

CISE-N-158/GA PC$4.00/MF$1.45
Centro Informazioni Studi Esperienze, Milan (Italy).
METHOD FOR THE DETERMINATION OF THE PRINCIPAL FISSION PRODUCTS CONTAINED IN FALLOUT SAMPLES.
A. Albini, G. Bonfanti, C. Cattaneo, C. Giacoletto, and C. Triulzi. Dec 72, 37p
In Italian. U.S. Sales Only.

Descriptors: (*Cise, *Radiation monitoring), (*Strontium 90, *Radiometric analysis), (*Cesium 137, Radiometric analysis), (*Cerium 144, Radiometric analysis), Biosphere, Europium 155, Fallout deposits, Fission products, Gamma spectroscopy, Iodine 131, Promethium 147, Ruthenium 103, Ruthenium 106, Separation processes, Zirconium 95.

For abstract, see NSA 28 03, number 05189.

CONF-730503-3/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85.
P. S. Rohwer. 1973, 16p SM-172/76

Descriptors: (*Tritium, *Radiation monitoring), (*Krypton 85, Radiation monitoring), (*Earth atmosphere, Radiation monitoring), Air, Environment, Gaseous wastes, Genetic effects, Radiation doses, Radioactive wastes, Rbe.

For abstract, see NSA 28 03, number 05540.

DOCKET-400027-10/GA PC$5.45/MF$1.45
Kerr-Mcgee Corp., Oklahoma City, Okla.
SEQUOYAH URANIUM HEXAFLUORIDE PRODUCTION PLANT. ENVIRONMENTAL REPORT, SUPPLEMENT 2.
18 Jan 73, 94p

Descriptors: (*Sequoyah uranium hexafluoride production p, *Environment), (*Industrial plants, Environment), Alpha sources, Beta sources, Fluorides, Monitoring, Nitrates, Production, Radiation monitoring, Radium 226, Uranium, Uranium hexafluoride, Water.

For abstract, see NSA 28 03, number 05526.

DOCKET-50201-141/GA PC$3.00/MF$1.45
Nuclear Fuel Services, Inc., West Valley, N.Y.
WEST VALLEY REPROCESSING PLANT. QUARTERLY REPORT, JANUARY 1, 1973--MARCH 31, 1973.
17 Apr 73, 8p

Descriptors: (*West valley processing plant, *Radiation monitoring), Gases, Liquids.

For abstract, see NSA 28 03, number 05541.

DOCKET-50268-43/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Glen Ellyn, Ill. Region III.
MIDWEST FUEL RECOVERY PLANT. STATE OF ILLINOIS TO MAINTAIN MONITORING SERVICES IN ILLINOIS.
8 Nov 72, 2p DOCKET-701308-2

Descriptors: (*Midwest fuel recovery plant, *Radiation monitoring), Licensing.

For abstract, see NSA 28 03, number 05554.

DOCKET-50268-44/GA PC$3.00/MF$1.45
General Electric CO., San Jose, Calif. Nuclear Energy Div.
MIDWEST FUEL RECOVERY PLANT. AMENDMENT 34, RESPONSE TO AEC QUESTIONS.
26 Mar 73, 12p NEDO-10178-15

Descriptors: (*Midwest fuel recovery plant, *Ventilation), (*Midwest fuel recovery plant, *Radiation monitoring), (*Fuel reprocessing plants, Radiation monitoring), Ground water, Licensing, Radioactivity.

For abstract, see NSA 28 03, number 05432.

DOCKET-701372-2/GA PC$5.00/MF$1.45
Gulf Energy and Environmental Systems, Inc., San Diego, Calif.
GULF YOUNGSVILLE NUCLEAR FACILITY. ENVIRONMENTAL IMPACT REPORT, ADDENDUM.
Feb 73, 56p GULF-EES-A-12380(Add.)

Descriptors: (*Fuel fabrication plants, *Environment), Fabrication, Industrial plants, Licensing, Nuclear fuels, Wind.

For abstract, see NSA 28 03, number 05585.

EUR-4937/GA PC$6.50/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
RADIOACTIVE POLLUTION: ITS ELIMINATION.
J. Vaccarezza. Apr 73, 89p
In French. U.S. Sales Only.

Descriptors: (*Radioisotopes, *Radiochemical analysis), (*Radioactive waste processing, *Reviews), (*Radioactive wastes, Reviews), (*Contamination, Reviews), Chemical analysis, Decontamination, Ore concentrates, Radioactivity.

For abstract, see NSA 28 03, number 05528.

EUR-4944/GA PC$4.50/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
ENVIRONMENTAL RADIOACTIVITY: ISPRA, 1971.
M. de Bortoli, and P. Gaglione. Apr 73, 48p
U.S. Sales Only.

Descriptors: (*Italy, *Radioactivity), (*Radioactive waste disposal, *Radiation monitoring), (*Human populations, *Radiation doses), Air pollution, Atmospheric precipitations, Beta sources, Cesium 137, Cobalt 60, Earth atmosphere, Environment, Fallout, Fishes, Food chains, Forage, Milk, Monitoring, Nonradioactive waste disposal, Plutonium 238, Plutonium 239, Radionuclide migration, Reactor sites, Strontium 89, Strontium 90, Surface waters, Water pollution, Zinc 65.

For abstract, see NSA 28 03, number 05542.

EUR-4952/GA PC$3.50/MF$1.45
European Atomic Energy Community, Karlsruhe (West Germany). Inst. Of Transuranium Elements.
HANDLING EXPERIENCE WITH TRANSPLUTONIUM ELEMENTS.
K. Buijs, and W. Muller. Apr 73, 28p CONF-720649-5
U.S. Sales Only.

Descriptors: (*Americium 241, *Remote handling), (*Americium 243, Remote handling), (*Curium 242, Remote handling), (*Curium 244, Remote handling), Californium 252, Corrosion, Criticality, Radiation protection, Shielding.

For abstract, see NSA 28 02, number 03453.

HEDL-SA-427/GA PC$3.25/MF$1.45
Aerojet Mfg. Co., Fullerton, Calif. (Usa). Westinghouse Hanford CO., Richland, Wash. (Usa).
DESIGN OF THE FFTF FUEL HANDLING SYSTEMS BOTTOM LOADING TRANSFER CASKS.
D. S. Madden, and E. E. Garrett. 21p CONF-720903-16

Descriptors: (*Casks, *Design), (*Spent fuel elements, *Remote handling), (*Reactor components, Remote handling), Fftf reactor, Radiation protection, Transport.

For abstract, see NSA 28 02, number 03454.

HEDL-SA-507/GA PC$3.50/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
MODELING THE REGIONAL TRANSPORT OF RADIONUCLIDES IN A MAJOR UNITED STATES RIVER BASIN.
J. F. Fletcher, W. L. Dotson, D. E. Peterson, and R. P. Betson. 1973, 26p CONF-730503-1, SM-172/40
Contract AT(45-1)-2170

Descriptors: (*Nuclear power plants, *Environment), (*Human populations, *Radiation doses), A codes, Computer calculations, Computer codes, Cumberland river, External irradiation, H codes, Health hazards, Internal irradiation, Man, Planning, Radioactive waste disposal, Radionuclide migration, Rivers, Site selection, Tennessee river, W codes.

For abstract, see NSA 28 03, number 05543.

LA-5184/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY. CALENDAR YEAR 1972.
J. E. Herceg. Mar 73, 54p
Contract W-7405-eng-36

Descriptors: (*Los alamos scientific lab, *Radiation monitoring), Earth atmosphere, Environment, Gaseous wastes, Ground water, Liquid wastes, Radioactive waste disposal, Radioactive wastes, Radionuclide migration, Sediments, Soils, Surface waters.

For abstract, see NSA 28 02, number 02572.

LA-5234-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966--MAY 1969.
W. D. Purtymun. Apr 73, 9p

Descriptors: (*Los alamos scientific lab, *Radioactive waste disposal), (*Tritium, *Radiation monitoring), Diffusion, Environment, Ground water, Liquid scintillation detectors, New mexico, Radiometric analysis, Rivers, Sampling, Surface waters.

For abstract, see NSA 28 02, number 02562.

MRR-105/GA PC$5.25/MF$1.45
Technische Universitaet Muenchen, Garching (West Germany). Laboratorium fuer Reaktorregelung und Anlagensicherung.
CRITICALITY SAFETY OF TYPICAL TRANSPORT AND STORAGE CONTAINERS FOR HOMOGENEOUS FISSIONABLE MATERIAL.
W. Thomas, and W. Weber. Apr 72, 61p
In German. U.S. Sales Only.

Descriptors: (*Criticality, *Fissile materials), (*Casks, *Safety), K codes, Safety, Storage, Transport.

For abstract, see NSA 28 02, number 03456.

ORO-2529-36/GA PC$11.25/MF$1.45
Arkansas Univ., Fayetteville. Dept. Of Chemistry.
ATMOSPHERIC RADIOCHEMISTRY. ANNUAL PROGRESS REPORT.
P. K. Kuroda. 30 Apr 73, 181p
Contract AT(40-1)-2529

Descriptors: (*Fallout deposits, *Radiation monitoring), (*Cerium 141, Radiation monitoring), (*Cerium 144, Radiation monitoring), (*Strontium 89, Radiation monitoring), Atmospheric explosions, China, Earth atmosphere, France, Gamma spectroscopy, Isotope ratio, Nuclear explosions, Rain, Sampling, Snow, Thermonuclear explosions, Usa, Barium 140, Diffusion, Strontium 90, Time dependence, Bismuth 210, Daughter products, Isotope applications, Lead 210, Meteorology, Polonium 210, Radon, Surface air, Tracer techniques, Troposphere.

For abstract, see NSA 28 02, number 02581.

PROT.-SAN.-11/71/GA PC$14.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
DATA ON ENVIRONMENTAL RADIOACTIVITY COLLECTED IN ITALY (JANUARY--DECEMBER 1970).
Oct 71, 249p
U.S. Sales Only.

Descriptors: (*Italy, *Radiation monitoring), (*Environment, *Radioactivity), Air, Beta particles, Beta sources, Bread, Cesium 137, Cobalt 60, Data, Earth atmosphere, Fallout deposits, Fishes, Fresh water, Meat, Milk, Molluscs, Nuclear power plants, Plutonium 239, Seawater, Sediments, Strontium 89, Strontium 90, Vegetables, Zirconium 95.

For abstract, see NSA 28 03, number 05544.

SCPRI(RM)-1-1973/GA PC$3.00/MF$1.45
Service Central de Protection Contre les Rayonnements Ionisants, le Vesinet (France).
REPORT OF ACTIVITY, JANUARY 1973.
1973, 18p
In French. U.S. Sales Only.

Descriptors: (*France, *Radiation monitoring), (*Environment, *Radioactivity), Earth atmosphere, Fallout, Gaseous wastes, Liquid wastes, Nuclear industry, Radioactive wastes, Sampling, Surface waters.

For abstract, see NSA 28 02, number 02582.

SCPRI(RM)-1-1973(Supp.)/GA PC$3.50/MF$1.45
Service Central de Protection Contre les Rayonnements Ionisants, le Vesinet (France).
ANNEX TO MONTHLY REPORT, JANUARY 1973. DETAIL OF RESULTS OF MEASUREMENT.
1973, 27p
In French. U.S. Sales Only.

Descriptors: (*France, *Radiation monitoring), (*Environment, *Radioactivity), Earth atmosphere, Fallout, Gaseous wastes, Liquid wastes, Nuclear industry, Radioactive wastes, Sampling, Surface waters.

For abstract, see NSA 28 02, number 02583.

TID-3337/GA PC$5.45/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY.
May 73, 103p

Descriptors: (*Tritium, *Bibliographies), Radiation monitoring, Radioactive waste disposal, Radioactive waste processing.

For abstract, see NSA 28 03, number 05545.

TLW-6105/GA PC$3.50/MF$1.45
Trapelo/West, Richmond, Calif.
ANALYSIS OF EXP 239 PU PARTICLES COLLECTED NEAR THE ROCKY FLATS FACILITY. FINAL REPORT.
M. W. Nathans, and W. D. Holland. 25 Oct 71, 29p
Contract NY-72-1915

Descriptors: (*Plutonium, *Abundance), (*Air filters, *Chemical analysis), Nsf-rfp reactor, Particle size, Plutonium 239, Quantitative chemical analysis.

For abstract, see NSA 28 02, number 02584.

USGS-474-169/GA PC$4.00/MF$1.45
Geological Survey, Lakewood, Colo. (Usa).
RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKIN EVENT, AMCHITKA ISLAND, ALASKA, OCTOBER 1972. AMCHITKA-40.
L. J. Schroder, and W. C. Ballance. May 73, 19p
Contract AT(29-2)-474

Descriptors: (*Amchitka island area, *Radiation monitoring), (*Tritium, Radiation monitoring), Alaska, Aleutian islands, Alpha sources, Beta sources, Gamma sources, Water.

For abstract, see NSA 28 02, number 02573.

Y-DR-109/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
CRITICAL THREE-DIMENSIONAL ARRAYS OF NEUTRON INTERACTING UNITS. PART IV. ARRAYS OF U(93.2) METAL REFLECTED BY CONCRETE AND ARRAYS SEPARATED BY VERMICULITE AND REFLECTED BY POLYETHYLENE.
D. W. Magnuson. 30 Apr 73, 12p
Contract W-7405-eng-26

Descriptors: (*Highly enriched uranium, *Criticality), Concretes, Neutron reflectors, Polyethylenes, Storage, Vermiculite.

For abstract, see NSA 28 02, number 03458.

18I. Reactor Engineering and Operation

AAEC/LIB/Bib-376/GA PC$5.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
FAST BREEDER REACTORS. A BIBLIOGRAPHY.
C. J. McDonald. Dec 72, 60p
U.S. Sales Only.

Descriptors: (*Fbr type reactors, *Bibliographies), Design, Fuel cycle, Performance, Reactor kinetics, Reactor operation, Specifications.

For abstract, see NSA 28 03, number 07319.

AAEC/TM-632/GA PC$3.25/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
AAEC FREON RIG ACTOR AND INITIAL BOILING CRISIS (BURNOUT) RESULTS.
V. Ilic. Nov 72, 23p
U.S. Sales Only.

Descriptors: (*Boiling, *Burnout), (*Freons, *Critical heat flux), (*Reactor cooling systems, Burnout), (*Coolant loops, *Design), Critical heat flux, Flow models, Forced convection, Heat exchangers, Heat transfer, Safety, Simulation, Stainless steels, Subcooling, Thermocouples, Water, Water cooled reactors.

For abstract, see NSA 28 03, number 05467.

AAEW-R-788/GA PC$4.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).

JOSHUA III: THREE-DIMENSIONAL DIFFUSION CODE WITH THERMAL HYDRAULIC FEEDBACK FOR FUEL MANAGEMENT STUDIES IN WATER COOLED REACTORS.
D. F. Pearce. Feb 73, 44p
U.S. Sales Only.

Descriptors: (*Computer codes, *J codes), (*Water cooled reactors, Fuel cycle), (*Fuel cycle, *Nuclear materials management), B codes, Doppler coefficient, Feedback, Neutron diffusion equation, Three-dimensional calculations, Water, Xenon.

For abstract, see NSA 28 03, number 07435.

AEC-tr-7423/GA PC$4.50/MF$1.45
Technischer Ueberwachungs-Verein E. V., Cologne (West Germany). Institut fuer Reaktorsicherheit.
SYSTEMATIC RECORDING AND EVALUATION OF FAILURES.
W. Fehndrich, J. Feldmann, L. F. Franzen, and A. Stoll. 1973, 50p IRS-W-4
Translation of .

Descriptors: (*Nuclear power plants, *Reliability), (*Reactor components, *Failures), Data acquisition, Data processing, Reactor instrumentation, Reactor operation, Statistics.

For abstract, see NSA 28 02, number 04655.

AEEW-R-843/GA PC$3.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
DYADIC APPROXIMATION METHOD FOR MULTIVARIABLE CONTROL SYSTEMS ANALYSIS WITH A NUCLEAR REACTOR SPATIAL CONTROL APPLICATION.
D. H. Owens. Jan 73, 33p
U.S. Sales Only.

Descriptors: (*Reactor control systems, *Reactor stability), Energy spectra, Feedback, Power density, Transfer functions, Transients.

For abstract, see NSA 28 03, number 07511.

AI-AEC-13038/GA PC$3.00/MF$1.45
Atomics International, Canoga Park, Calif.
HAA-3 USER REPORT.
R. S. Hubner, E. U. Vaughan, and L. Baurmash. 30 Mar 73, 108p
Contract AT(04-3)-824

Descriptors: (*Fbr type reactors, *Reactor accidents), (*Sodium cooled reactors, Reactor accidents), (*Computer codes, H codes), (*H codes, *Aerosols), Containment systems.

For abstract, see NSA 28 02, number 04527.

ANCR-1098/GA PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
SYNTHETIC TREE MODEL: A FORMAL METHODOLOGY FOR FAULT TREE CONSTRUCTION.
J. B. Fussell. Mar 73, 118p
Contract AT(10-1)-1375

Descriptors: (*Computer codes, *D codes), (*Reactor safety, Fault tree analysis), (*Fault tree analysis, *Computer calculations), Design, Electric power, Failures, Optimization, Planning, Reactor components, Reliability, Scram.

For abstract, see NSA 28 03, number 07417.

BMFT-FBK-73-3/GA PC$5.25/MF$1.45
Siemens a.G., Erlangen (West Germany).
FLOW MEASUREMENTS IN THE LOWER PLENUM OF A PWR VESSEL.
E. Weber, and W. Dittrich. Mar 73, 64p
In German. U.S. Sales Only.

Descriptors: (*Pwr type reactors, Reactor cores), (*Reactor cores, *Fluid flow), Design, Distribution, Flow rate, Fluid mechanics, Mechanical structures, Mockup, Supports.

For abstract, see NSA 28 02, number 04494.

CEA-CONF-2141/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Paris (France).
IMPORTANCE OF OPERATIONAL RELIABILITY DATA FOR AN ESTIMATE OF THE RELIABILITY OF A COMPLEX SYSTEM.
A. Carnino, A. Pavret de la Rochefordiere, and R. Quenee. 1972, 12p CONF-720979-1
In French. U.S. Sales Only.

Descriptors: (*Reactor control systems, *Reliability), (*Reactor components, *Failures), Computer calculations, Probability, Reactor accidents, Reactor safety, Reactor shutdown, Scram rods, Statistics.

For abstract, see NSA 28 02, number 04646.

CEA-CONF-2220/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
SURVEILLANCE OF THE EMBRITTLEMENT OF A PRESSURIZED WATER REACTOR VESSEL.
C. Devillers, and C. Dupont. 9p CONF-721018-13
In French. U.S. Sales Only.

Descriptors: (*Pwr type reactors, Pressure vessels), (*Pressure vessels, *Physical radiation effects), Embrittlement, Fast neutrons, Inspection, Monitoring, Neutron fluence, Radiation doses.

For abstract, see NSA 28 02, number 04496.

CONF-720975-/GA PC$4.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. Of Nuclear Engineering.
PROCEEDINGS OF THE WORKSHOP ON NUCLEAR ENERGY, THE ENVIRONMENT, AND ENGINEERING EDUCATION, HELD IN WASHINGTON, D.C., SEPTEMBER 28-29, 1972.
R. L. Murray. 1972, 43p

Descriptors: Education, Energy, Environment, Industry, Meetings, Nuclear engineering, Nuclear power.

For abstract, see NSA 28 02, number 04948.

CONF-721202-18/GA PC$3.00/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
EFFLUENT MONITORING IN NUCLEAR PLANTS USING ON-LINE GAMMA-RAY SPECTROMETRY.
R. L. Heath, and J. E. Cline. 15p

Descriptors: (*Gamma spectrometers, On-line measurement systems), (*On-line measurement systems, Radioactive wastes), (*Radioactive wastes, *Radiation monitoring), (*Nuclear power plants, Radioactive wastes), Design, Environment, Fission products, Gamma spectra, Li-drifted ge detectors, Pdp computers, Radioisotopes, Real time systems.

For abstract, see NSA 28 03, number 07421.

CONF-730304-4/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
ESTIMATE OF EFFECT OF LOCALIZED FLOW BLOCKAGES ON PWR CLAD TEMPERATURES DURING REFLOOD.
W. R. Gambill. 1972, 26p

Descriptors: (*Pwr type reactors, Loss of coolant), (*Loss of coolant, *Flow blockage), (*Fuel cans, *Heat transfer), Fluid flow, Mathematical models.

For abstract, see NSA 28 02, number 04580.

CONF-730304-5/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
PWR BLOWDOWN HEAT TRANSFER SEPARATE-EFFECTS PROGRAM.
C. G. Lawson, R. H. Chapman, and H. W. Hoffman. 34p

Descriptors: (*Pwr type reactors, Blowdown), (*Blowdown, *Heat transfer), Fluid flow, Fuel element clusters, Loss of coolant, Planning, Power, Pressure dependence, Transients.

For abstract, see NSA 28 02, number 04581.

CONF-730304-7/GA PC$3.00/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
COMPARISON OF THERMAL--HYDRAULIC RESPONSE OF LOFT AND A LARGE PRESSURIZED WATER REACTOR TO LOCA CONDITIONS.
P. R. Davis, and J. Dugone. 1973, 9p
Contract AT(10-1)-1375

Descriptors: (*Pwr type reactors, Loss of coolant), (*Loss of coolant, *Heat transfer), (*Loft reactor, Loss of coolant), Analytical solution, Blowdown, Computer calculations, Hydrodynamics, Primary coolant circuits, Reactor cores, Simulation, Thermodynamics.

For abstract, see NSA 28 02, number 04582.

CONF-730427-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
EXPLORATORY MODEL STUDIES OF REACTOR PLATFORM MOTIONS. I. UNPROTECTED DEEP WATER SITES.
D. G. Thomas, J. D. Sheppard, and R. P. Hammond. 1973, 4p

Descriptors: (*Nuclear power plants, Reactor sites), (*Reactor sites, *Seas), Acceleration, Motion, Stability.

For abstract, see NSA 28 03, number 07422.

DOCKET-50201-139/GA PC$3.00/MF$1.45
Nuclear Fuel Services, Inc., Rockville, MD.
WEST VALLEY REPROCESSING PLANT. APPROACH TO ACCIDENT ANALYSES.
7 Dec 72, 2p

Descriptors: (*West valley processing plant, *Safety), Accidents, Licensing.

For abstract, see NSA 28 03, number 05430.

DOCKET-50201-140/GA PC$3.00/MF$1.45
Nuclear Fuel Services, Inc., West Valley, N.Y.
WEST VALLEY REPROCESSING PLANT. HEAD END VENTILATION SYSTEM PERFORMANCE REPORT, JULY 1--DECEMBER 31, 1972.
Mar 73, 4p

Descriptors: (*West valley processing plant, *Ventilation), Head end processes, Licensing.

For abstract, see NSA 28 03, number 05431.

DP-Report-622/GA PC$5.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).
HELIUM COOLANT CHEMISTRY AND THE BASIC DESIGN OF A MOLECULAR SIEVE H SUB 2 O AND CO SUB 2 ADSORPTION PLANT FOR LOW INLET PARTIAL PRESSURES USING DRAGON PROJECT AND OTHER PUBLISHED EXPERIMENTAL DATA FOR THE COARSE PURIFICATION OF THE HELIUM COOLANT USED IN A 1,500MW(TH) HIGH

TEMPERATURE GAS-COOLED POWER REACTOR. DRAGON PROJECT.
C. Harper, and D. V. Kinsey. Mar 69, 63p
U.S. Sales Only.

Descriptors: (*Molecular sieves, *Design), (*Htgr type reactors, *Primary coolant circuits), (*Helium, *Purification), Carbon dioxide, Chemistry, Water.

For abstract, see NSA 28 03, number 07288.

DP-Report-639/GA PC$5.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
NEW METHODS FOR THE INVESTIGATION OF RADIOISOTOPE TRANSPORT IN A GAS COOLED REACTOR. DRAGON PROJECT.
P. R. Rowland. Mar 69, 57p
U.S. Sales Only.

Descriptors: (*Dragon reactor, *Reactor cooling systems), (*Gas cooled reactors, Reactor cooling systems), Fission products, Measuring methods, Radioisotopes, Sampling.

For abstract, see NSA 28 02, number 04502.

DP-Report-645/GA PC$3.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).
EXPERIMENTS WITH 'C' TYPE AVICA SEALS. DRAGON PROJECT.
A. Stringer. Jun 69, 23p
U.S. Sales Only.

Descriptors: (*Seals, *Performance), (*Dragon reactor, *Sealing materials), (*Helium, Sealing materials), Coatings, Flanges, High temperature, Leaks, Primary coolant circuits.

For abstract, see NSA 28 02, number 03319.

DP-Report-667/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
ECONOMICS OF THE FIRST GENERATION HIGH TEMPERATURE REACTORS AND FUTURE PROSPECTS. DRAGON PROJECT.
H. Gutmann, J. Daub, H. Schober, G. Graziani, and C. Zanantoni. Oct 69, 17p CONF-691020-4
U.S. Sales Only.

Descriptors: (*Htgr type reactors, *Economics), Cost.

For abstract, see NSA 28 03, number 07289.

DP-Report-690/GA PC$3.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
INFLUENCE OF FUEL AND FUEL ELEMENT ON POWER REACTOR GENERATING COSTS. DRAGON PROJECT.
H. Gutmann, J. Daub, G. Mancini, H. R. Schober, and G. Graziani. Jan 71, 33p CONF-691140-2
U.S. Sales Only.

Descriptors: (*Htgr type reactors, *Economics), Cost, Fuel elements, Solid fuels.

For abstract, see NSA 28 03, number 07291.

DPSPU-72-30-9/GA PC$3.25/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. Atomic Energy Div.
NUCLEAR OPERATIONS AND THE ENVIRONMENT: SAVANNAH RIVER PLANT.
W. P. Bebbington. Jan 73, 24p
Contract AT(07-2)-1

Descriptors: (*Savannah river plant, *Environment), Biological effects, Biological radiation effects, Ecosystems, Human populations, Monitoring, Nonradioactive waste disposal, Personnel, Radiation monitoring, Radiation protection, Radioactive waste disposal, Radioactivity, Radionuclide migration, Waste heat.

For abstract, see NSA 28 03, number 05527.

DUN-8028-B/GA PC$3.00/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
FINAL REPORT PRODUCTION TEST NO. PT-M-318 AND TEST CHANGE NO. 1 PRESSURIZER LEVEL AND INJECTION WATER FLOW CONTROL TEST.
J. K. Flickinger. 6 Mar 73, 12p

Descriptors: (*N-reactor, *Pressurizers), Control systems, Level indicators, Performance testing, Transients, Valves, Water.

For abstract, see NSA 28 03, number 07292.

DUN-8043/GA PC$3.00/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
STATUS OF THE 117-N CHARCOAL FILTERS, JUNE 1972.
E. C. Bennett, and D. E. Strege. 23 Aug 72, 11p
Contract AT(45-0)-1857

Descriptors: (*N-reactor, *Filters), Charcoal, Containment, Containment systems, Efficiency, Iodine, Performance testing.

For abstract, see NSA 28 03, number 07293.

DUN-8131/GA PC$6.25/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
N REACTOR PIPING DECONTAMINATION, 1973.
D. B. Ferguson, J. W. Frymier, and J. L. Lorenzen. 27 Feb 73, 85p

Descriptors: (*N-reactor, *Primary coolant circuits), Corrosion products, Decontamination, Fission products, Pipelines, Pipes, Reactor operation.

For abstract, see NSA 28 03, number 07294.

EURFNR-1062/GA PC$5.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Angewandte Systemtechnik und Reaktorphysik.
SYSTEMATIC ERRORS AND POSSIBILITIES OF CORRECTION IN INVERSE KINETIC CONTROL ROD CALIBRATIONS.
H. Walze. Nov 72, 72p KFK-1701

Descriptors: (*Sneak reactor, Shim rods), (*Shim rods, *Calibration), Control rod worths, Corrections, Errors, Neutron flux, Reactivity worths.

For abstract, see NSA 28 02, number 04647.

EURFNR-1072/GA PC$5.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
PRAWDA 2: A FORTRAN PROGRAM FOR THE THERMAL AND HYDRAULIC DESIGN OF FAST REACTORS. USER MANUAL.
K. Doetschmann. Nov 72, 62p KFK-1698

Descriptors: (*Fast reactors, Reactor cores), (*Reactor cores, *Hydraulics), (*Computer codes, *P codes), Fortran, Ibm computers, Specifications, Thermodynamics.

For abstract, see NSA 28 03, number 07328.

EURFNR-1077/GA PC$5.45/MF$1.45
Reactor Centrum Nederland, Petten.
FAST REACTOR PROGRAMME. FOURTH QUARTER 1972 PROGRESS REPORT.
E. K. Hoekstra. Feb 73, 94p RCN-183
U.S. Sales Only.

Descriptors: (*Fbr type reactors, *Research programs), (*Sodium cooled reactors, Research programs), (*Reactor kinetics, *Neutron spectra), (*Fission products, *Reactivity worths), Aerosols, Chemical preparation, Configuration, Energy spectra, Failures, Fuel assemblies, Fuel cans, Fuel rods, Heat transfer, Heaters, Hydraulics, Liquid flow, Mechanical properties, Neutron flux, Performance, Physical radiation effects, Sodium, Uranium carbides.

For abstract, see NSA 28 03, number 07330.

FEI-348/GA PC$3.75/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
CONCERNING BOUNDARY STEAM-CONTENT DURING BOILING OF STEAM--LIQUID MIXTURE IN PIPES.
A. A. Ivashkevich. 1972, 34p
In Russian. U.S. Sales Only.

Descriptors: (*Boiling, *Critical heat flux), Mixtures, Pipes, Steam, Two-phase flow, Water.

For abstract, see NSA 28 03, number 05468.

GEAP-10207-28/GA PC$5.45/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
REACTOR PRIMARY COOLANT SYSTEM PIPE RUPTURE STUDY. PROGRESS REPORT NO. 28, JULY--DECEMBER 1972.
Feb 73, 88p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, Primary coolant circuits), (*Primary coolant circuits, Pipes), (*Pipes, *Ruptures), Carbon steels, Computer codes, Cracks, Creep, Elasticity, Fatigue, Inconel 600, Materials testing, Metallography, Pipe joints, Plasticity, Reliability, Stainless steel-304, Stainless steel-304l, Strain hardening, Strains, Stresses, Welded joints.

For abstract, see NSA 28 03, number 07424.

GEAP-10763/GA PC$4.00/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
LOW CYCLE FATIGUE OF PROTOTYPE PIPE COMPONENTS.
J. D. Heald, and E. Kiss. Jan 73, 40p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, Pipes), (*Pipes, *Fatigue), (*Pwr type reactors, Pipes), Bending, Cracks, Failures, Performance testing, Pipe joints, Primary coolant circuits, Stainless steel-304, Steel-astm-a106, Thermal fatigue.

For abstract, see NSA 28 03, number 07425.

GEAP-13255/GA PC$3.75/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
BLOWDOWN HEAT TRANSFER PROGRAM. TASK A1 INFORMAL REPORT: 49 ROD BUNDLE PRELIMINARY TEST PLAN.
Jan 72, 34p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, Blowdown), (*Blowdown, *Heat transfer), Fuel element clusters, Mockup, Nozzles, Primary coolant circuits, Pumps, Reactor accidents, Reactor safety, Ruptures, Structural models, Testing.

For abstract, see NSA 28 02, number 04584.

GEAP-13274/GA PC$3.75/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.

BLOWDOWN HEAT TRANSFER PROGRAM. TASK B-2 SKIN HEATER FEASIBILITY TEST RESULTS.
G. L. Sozzi. Mar 72, 35p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, Blowdown), (*Heaters, *Performance testing), (*Blowdown, *Heat transfer), Electricity, Fuel element clusters, Fuel rods, Heating, Reactor accidents, Simulators, Structural models.

For abstract, see NSA 28 02, number 04585.

GEAP-13276/GA PC$8.50/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
BLOWDOWN HEAT TRANSFER PROGRAM. TASK C-1 INFORMAL REPORT, PRELIMINARY SYSTEM DESIGN DESCRIPTION OF TWO-LOOP TEST APPARATUS.
G. W. Burnette, D. W. Danielson, and K. A. Nilsson. Mar 72, 128p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, Blowdown), (*Blowdown, *Heat transfer), Design, Reactor accidents, Structural models, Testing.

For abstract, see NSA 28 02, number 04586.

GEAP-13295/GA PC$10.60/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
TRANSIENT CRITICAL HEAT FLUX: EXPERIMENTAL RESULTS.
B. S. Shiralkar, E. E. Polomik, R. T. Jr. Lahey, J. M. Gonzalez, and D. W. Radcliffe. Sep 72, 373p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, *Critical heat flux), Fluid flow, Fuel channels, Fuel element clusters, Fuel elements, Fuel rods, Power, Pressure dependence, Reactor accidents, Simulation, Transients.

For abstract, see NSA 28 02, number 04486.

GEAP-13908/GA PC$5.45/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
ALTERNATE SHUTDOWN SYSTEM CONCEPT SELECTION.
E. R. McKeehan, B. M. Shawver, and W. E. Taft. Jan 73, 149p
Contract AT(04-3)-189

Descriptors: (*Fbr type reactors, *Reactor shutdown), (*Sodium cooled reactors, Reactor shutdown), (*Reactor control systems, *Design), Control elements, Reactor cores, Reliability, Scram.

For abstract, see NSA 28 02, number 04648.

GU-5295/GA PC$5.50/MF$1.45
Gulf United Nuclear Fuels Corp., Elmsford, N.Y.
PRELIMINARY REPORT ON LIGHT WATER REACTOR DECOMMISSIONING COSTS.
Jan 73, 69p
Contract AT(11-1)-1756

Descriptors: (*Bwr type reactors, Reactor dismantling), (*Pwr type reactors, Reactor dismantling), (*Reactor dismantling, *Cost), Reactor shutdown.

For abstract, see NSA 28 03, number 07260.

GULF-GA-A-12421/GA PC$5.45/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
GAS-COOLED FAST BREEDER REACTOR. QUARTERLY PROGRESS REPORT, AUGUST 1--OCTOBER 31, 1972.
8 Dec 72, 85p
Contract AT(04-3)-167

Descriptors: (*Gcfr reactor, *Research programs), (*Fuel rods, *Fuel densification), Planning, Configuration, Fuel assemblies, Hot pressing, Reactor cores, Spacers, Testing, Materials testing, Physical radiation effects, Solid fuels, Uranium dioxide, Criticality, Delayed neutron fraction, Doppler coefficient, Reactivity worths, Reactor kinetics.

For abstract, see NSA 28 02, number 04539.

JABE-WADCO-4/GA PC$10.25/MF$1.45
Blume (John a.) and Associates, Engineers, San Francisco, Calif.
SUPPLEMENTARY GEOLOGIC INVESTIGATIONS FOR SEISMIC EVALUATION OF THE FFTF SITE NEAR RICHLAND, WASHINGTON.
Feb 71, 162p

Descriptors: (*Fftf reactor, *Reactor sites), Geology, Reactor safety, Site selection, Washington.

For abstract, see NSA 28 02, number 04588.

JABE-WADCO-7/GA PC$13.50/MF$1.45
Blume (John a.) and Associates, Engineers, San Francisco, Calif.
SUBSURFACE GEOLOGIC INVESTIGATIONS FOR THE FFTF PROJECT IN PASCO BASIN.
Oct 71, 228p

Descriptors: (*Fftf reactor, *Reactor sites), Geology, Reactor safety, Site selection, Washington.

For abstract, see NSA 28 02, number 04589.

JAPFNR-88/GA PC$3.25/MF$1.45
Fuji Electric CO. Ltd., Tokyo (Japan).
DEVELOPMENT OF CONTROL ROD WORTH CALCULATIONS BY THE MONTE CARLO METHOD.
Mar 72, 22p
U.S. Sales Only.

Descriptors: (*M codes, *Control rod worths), (*Fbr type reactors, Control rod worths), (*Joyo reactor, Control rod worths), (*Computer codes, M codes), Mockup, Monte carlo method.

For abstract, see NSA 28 03, number 07335.

JUL-918-RG/GA PC$8.25/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorentwicklung.
ANALOGUE COMPUTER STUDIES OF THE CONTROL DYNAMICS OF A 600 MW(E) HTR HELIUM TURBINE SYSTEM. PART 1. DESCRIPTION OF THE CONSIDERED POWER PLANT CONCEPT AND THE COMPUTATION MODEL APPLIED.
G. Hewing, and J. R. Dean. Jan 73, 121p
In German. U.S. Sales Only.

Descriptors: (*Htgr type reactors, *Reactor operation), Analog computers, Computer calculations, Direct cycle cooling systems, Gas turbines, Numerical solution, Power, Reactor kinetics, Transients.

For abstract, see NSA 28 02, number 04504.

KFK-1735/GA PC$6.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Labor fuer Elektronik und Messtechnik.
SAFETY ASSEMBLIES FOR FAST SODIUM COOLED REACTORS.
S. Jacobi, H. Lenhardt, and R. Schneider. Feb 73, 85p
In German. U.S. Sales Only.

Descriptors: (*Sodium cooled reactors, *Failed element monitors), (*Fbr type reactors, Failed element monitors), (*Reactor control systems, *Reliability), Digital computers, Electronic equipment, Failures, Fuel elements, Reactor safety, Reactor shutdown.

For abstract, see NSA 28 02, number 04649.

KFK-1782/GA PC$3.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Angewandte Systemtechnik und Reaktorphysik.
PRELIMINARY ANALYSIS OF THE PREDISASSEMBLY PHASE OF THE UNPROTECTED OVERPOWER TRANSIENT ACCIDENT FOR SNR-300.
W. E. Kastenberg, and E. T. III Rumble. Mar 73, 28p
U.S. Sales Only.

Descriptors: (*Fbr type reactors, *Reactor safety), (*Liquid metal cooled reactors, Reactor safety), (*Snr reactor, Reactor safety), Computer calculations, Heat transfer, Meltdown, Reactivity insertions, S codes, Transients, Very high temperature.

For abstract, see NSA 28 03, number 07338.

N73-27577/8GA PC$5.50/MF$1.45
National Reactor Testing Station, Idaho Falls, Idaho.
FEASIBILITY STUDY OF FULL-REACTOR GAS CORE DEMONSTRATION TEST.
J. F. Kunze, J. H. Lofthouse, C. J. Shaffer, and P. J. Macbeth. Jun 73, 67p NASA-CR-121190, ANCR-1120
NASA ORDER C-597188

Descriptors: *Gaseous fission reactors, *Performance tests, *Scale models, Coolants, High temperature tests, Hydrogen, Reactor cores, Reactor physics.

For abstract, see STAR 1118

N73-27578/6GA PC$6.25/MF$1.45
National Reactor Testing Station, Idaho Falls, Idaho.
FLOWING GAS, NON-NUCLEAR EXPERIMENTS ON THE GAS CORE REACTOR.
J. F. Kunze, C. G. Cooper, and P. J. Macbeth. Jun 73, 81p NASA-CR-121191, ANCR-1118
NASA ORDER C-545588

Descriptors: *Critical experiments, *Flow distribution, *Gas reactors, *Reactor technology, Nuclear fuels, Reactor cores, Reactor physics.

For abstract, see STAR 1118

N73-27582/8GA PC$4.50/MF$1.45
Atomics International, Canoga Park, Calif.
SPACE NUCLEAR SYSTEM VOLUME ACCUMULATOR DEVELOPMENT (SNAP PROGRAM).
Summary Report.
W. D. Whitaker, and T. T. Shimazaki. 30 Jun 73, 50p NASA-CR-121245, AI-AEC-13090
NASA ORDER C-21030-C, Contract AT(04-3)-701

Descriptors: *Accumulators, *Advanced sodium cooled reactor, *Thermoelectric cooling, Cooling systems, Pressure vessels, Reactor design.

For abstract, see STAR 1118

N73-27583/6GA PC$3.50/MF$1.45
Atomics International, Canoga Park, Calif.
VOLUME ACCUMULATOR DESIGN ANALYSIS COMPUTER CODES.
W. D. Whitaker, and T. T. Shimazaki. 30 Jun 73, 30p NASA-CR-121246, AI-AEC-13094
NASA ORDER C-21030-C, Contract AT(04-3)-701

Descriptors: *Computer programs, *Snap, *Thermoelectric power generation, Computerized design, Cooling systems, Failure modes.

For abstract, see STAR 1118

N73-28182/6GA PC$5.25/MF$1.45
Siemens-Schuckertwerke A.G., Erlangen (West Germany).
FLOW MEASUREMENT AT THE BOTTOM OF THE LOWER PLENUM OF A PRESSURIZED WATER REACTOR CONTAINER STROEMUNGSTECHNISCHE UNTERSUCHUNGEN DES UNTEREN KUGELBODENS EINES DRUCKWASSERREAKTORBEHAELTERS.
E. Weber, and W. Dittrich. Mar 73, 64p BMFT-FB-K-73-03
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Flow velocity, *Plenum chambers, *Pressure vessels, *Pressurized water reactors, *Reactor cores, Containment, Spherical tanks, Structural design, Velocity distribution.

For abstract, see STAR 1119

ORNL-NSIC-107/GA PC$8.00/MF$1.45
Oak Ridge National Lab., Tenn.
INDEX TO NUCLEAR SAFETY. A TECHNICAL PROGRESS REVIEW BY CHRONOLOGY, PERMUTED TITLE, AND AUTHOR. VOL. 1, NO. 1 THROUGH VOL. 13, NO. 6.
J. P. Blakely, and A. Klein. May 73, 144p
Contract W-7405-eng-26

Descriptors: (*Radiation protection, *Indexes), (*Reactor safety, Indexes).

For abstract, see NSA 28 03, number 05968.

ORNL-TM-3939/GA PC$5.50/MF$1.45
Oak Ridge National Lab., Tenn.
MSR COMPONENT REPLACEMENTS USING REMOTE CUTTING AND WELDING TECHNIQUES.
P. P. Holz. Dec 72, 62p
Contract W-7405-eng-26

Descriptors: (*Molten salt reactors, Reactor maintenance), (*Reactor maintenance, *Remote handling), Cutting, Heat exchangers, Manipulators, Pumps, Reactor components, Valves, Welding.

For abstract, see NSA 28 02, number 04505.

ORNL-TM-4082/GA PC$6.50/MF$1.45
Oak Ridge National Lab., Tenn.
ACRA: A COMPUTER PROGRAM FOR THE ESTIMATION OF RADIATION DOSES CAUSED BY A HYPOTHETICAL REACTOR ACCIDENT.
F. W. Stallmann, and F. B. K. Kam. Apr 73, 87p
Contract W-7405-eng-26

Descriptors: (*Reactor accidents, *Radioactive clouds), (*Computer codes, *A codes), Deposition, Earth atmosphere, Fission products, Radiation doses, Time dependence, Washout.

For abstract, see NSA 28 02, number 04590.

ORNL-TM-4205/GA PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn.
COMMENTS ON THE APPLICATION OF PWR-FLECHT EXPERIMENTAL RESULTS TO A LOCA.
W. R. Gambill, J. J. Keyes, T. S. Kress, and C. G. Lawson. 11 Apr 73, 96p
Contract W-7405-eng-26

Descriptors: (*Pwr type reactors, Loss of coolant), (*Eccs, *Performance), (*Loss of coolant, *Heat transfer), Cooling, Droplets, Entrainment, Flow blockage, Fuel cans, Reactor cores.

For abstract, see NSA 28 02, number 04591.

ORNL-4855/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
HEAVY-SECTION STEEL TECHNOLOGY PROGRAM. SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING AUGUST 31, 1972.
Apr 73, 78p
Contract W-7405-eng-26

Descriptors: (*Steel-astm-a533, *Mechanical properties), (*Steel-astm-a508, Mechanical properties), Bwr type reactors, Cracks, Fracture properties, Neutrons, Nondestructive testing, Physical radiation effects, Pipes, Pressure vessels, Pwr type reactors, Reactor cooling systems, Reactor materials, Steels, Temperature dependence, Thickness, Welded joints.

For abstract, see NSA 28 03, number 06277.

ORNL-4877/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
BORON CONCENTRATION GRADIENT FOR IMPROVED THERMAL REACTOR PERFORMANCE OF BORON-STAINLESS STEEL CONTROL RODS.
R. J. Beaver, and A. E. Richt. May 73, 46p
Contract W-7405-eng-26

Descriptors: (*Sm-1 reactor, Control elements), (*Control elements, *Performance), Boron additions, Boron 10, Burnup, Dispersions, Distribution, Physical radiation effects, Quantity ratio, Stainless steels, Swelling, Thermal neutrons.

For abstract, see NSA 28 03, number 07513.

PAT-APPL-376258/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN ION EXCHANGE NUCLEAR REACTOR.
Patent Application.
J. L. Power. Filed 3 Jul 73, 28p NASA-CASE-LEW-11645-2,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aqueous solutions, *Ion exchanging, *Thermal reactors, Patent applications, Reactor cores, Reactor design.

A fuel system is described for a thermal nuclear reactor which utilizes an ionorganic ion exchanger to retain nuclear fuel in the reactor core. A circulating aqueous solution supplies the fuel to the ion exchanger, removes the fuel from the ion exchanger, acts as a moderator, effects control of the reactor power, and removes deleterious products from the reactor core portion of the fuel system.

RT/GIU-(73)1/GA PC$4.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ITALIAN REGULATIONS FOR THE HOLDING, USE OF, AND TRADE IN RADIOACTIVE SUBSTANCES.
F. Nocera. 30 Jan 73, 53p
In Italian. U.S. Sales Only.

Descriptors: (*Italy, *Atomic energy laws), (*Fissionable materials, *Regulations), (*Radioactive wastes, Regulations), Nuclear materials management, Radiation protection, Radioisotopes, Storage, Transport, Transport, Uses.

For abstract, see NSA 28 03, number 06459.

SLA-73-5152/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
RECENT DEVELOPMENTS IN STRESS ANALYSIS TECHNIQUES FOR FAST BURST REACTORS.
J. A. Reuscher. 1972, 14p CONF-730212-2

Descriptors: (*Pulsed reactors, *Stress analysis), Elasticity, Mathematical models, Plasticity, Reactor cores, Reactor materials.

For abstract, see NSA 28 03, number 07365.

TM-65-4-16/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
EVALUATION OF ULTRA FINE TUNGSTEN POWDER FOR FUELED CORES.
R. E. Seibert. 12 Apr 65, 3p
Contract AT(40-1)-2847

Descriptors: (*Tungsten, *Powders), (*Nuclear fuels, *Fabrication), Hydrogen, Performance, Reduction, Tungsten fluorides, Uranium dioxide.

For abstract, see NSA 28 02, number 03159.

UNC-5163/GA PC$7.50/MF$1.45
United Nuclear Corp., Elmsford, N. Y. Research and Engineering Center.
CONTAINMENT PRESSURE OF ELK RIVER REACTOR WITH ZIRCALOY-CLAD CORE FOLLOWING A LOSS-OF-COOLANT ACCIDENT.
M. H. Cooper, R. D. Hankel, and B. R. Teer. 15 Dec 66, 106p
Contract AT(11-1)-1648

Descriptors: (*Err reactor, *Loss of coolant), After-heat, Blowdown, Containment, Eccs, Heat transfer, Performance, Pressure dependence, Reactor accidents, Reactor cores, Zirconium.

For abstract, see NSA 28 03, number 07429.

ZJE-120/GA PC$10.75/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
ACCIDENT AND SAFETY ANALYSIS OF THE KS-150 REACTOR.
J. Hulovec. 1972, 171p
U.S. Sales Only.

Descriptors: (*Bohunice a-1 reactor, *Reactor safety), Computer calculations, Mathematical models, Reactor accidents.

For abstract, see NSA 28 03, number 07308.

18J. Reactor Materials

AAEC/E-227/GA PC$4.50/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
FAST FISSION RATIO MEASSUREMENTS IN MULTI-ROD CLUSTERS.
A. Rose, H. M. Jain, and P. F. Menezes. Oct 72, 47p
U.S. Sales Only.

Descriptors: (*Fuel element clusters, *Fission ratio), (*Uranium 235, Fission ratio), (*Uranium 238, Fission ratio), Calibration, Configuration, Coolants, Counting techniques, Fission chambers, Foils, Fuel rods, Gamma detection, Gamma radiation, Geometry, Irradiation, Lanthanum 140, Li-drifted ge detectors, Polystyrene, Scintillation counters, Simulation, Uranium dioxide, Water, Zerlina reactor.

For abstract, see NSA 28 03, number 07432.

AECL-4313/GA PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
BURNUP DETERMINATION OF A FUEL STRING BY CHEMICAL AND ISOTOPIC ANALYSIS.
R. W. Durham, and V. Corriveau. Feb 73, 17p
U.S. Sales Only.

Descriptors: (*Fuel element clusters, *Burnup), (*Uranium, *Voltametry), (*Plutonium, *Alpha spectroscopy), (*Uranium isotopes, *Mass spectroscopy), Chemical analysis, Fission, Isotopes, Plutonium isotopes, Solutions.

For abstract, see NSA 28 02, number 02209.

AEEW-R-830/GA PC$7.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
CONTROL OF THE COUNTING LABORATORY AT AEE, WINFRITH, BY A SMALL COMPUTER.
W. H. Taylor, G. H. D. Darwall, and A. B. Keats. Apr 72, 113p
U.S. Sales Only.

Descriptors: (*Fuel elements, *Activation analysis), (*Control systems, *Operation), Automation, Computers, Counting techniques, Data acquisition, Data processing, Neutron beams, Performance, Planning, Radiation detectors.

For abstract, see NSA 28 02, number 02645.

AERE-R-6897/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
THERMAL DIFFUSION MECHANISMS AND POSSIBLE MASS TRANSPORT PATHS IN CLOSED CARBIDE AND OXYCARBIDE SYSTEMS.
M. G. Adamson. Dec 72, 18p
U.S. Sales Only.

Descriptors: (*Uranium carbides, *Thermal diffusion), (*Plutonium carbides, Thermal diffusion), (*Carbon, Thermal diffusion), (*Nuclear fuels, Thermal diffusion), Carbon monoxide, Hydrides, Mass transfer, Oxides, Phase transformations.

For abstract, see NSA 28 02, number 03015.

ANL-7957/GA PC$5.45/MF$1.45
Argonne National Lab., Ill.
SODIUM TECHNOLOGY QUARTERLY REPORT, APRIL--JUNE 1972.
G. M. Kesser. Nov 72, 72p
Contract W-31-109-eng-38

Descriptors: (*Sodium, *Impurities), (*Sodium cooled reactors, Reactor cooling systems), (*Reactor cooling systems, *On-line measurement systems), Measuring methods, Qualitative chemical analysis, Sampling, Carbon, Cover gas, Hydrogen, Oxygen, Specifications, Leak detectors, Performance testing, Carburization, Chemical reactions, Decarbonization, Physical radiation effects, Stainless steels, Temperature dependence, Fission products, Monitoring, Tritium, Distillation, Vacuum systems.

For abstract, see NSA 28 02, number 04528.

ANL-7972/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
CHEMICAL ENGINEERING DIVISION FUEL CYCLE TECHNOLOGY QUARTERLY REPORT, JULY--SEPTEMBER 1972.
D. S. Webster, A. A. Jonke, N. M. Levitz, W. E. Miller, and M. J. Steindler. Dec 72, 75p
Contract W-31-109-eng-38

Descriptors: (*Spent fuels, *Reprocessing), Research programs.

For abstract, see NSA 28 03, number 05427.

ANL-7979/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTIONS, AND DOSIMETRY SEMMIANNUAL REPORT, JULY--DECEMBER 1972.
R. P. Larsen, N. D. Dudey, C. E. Crouthamel, M. Levenson, and R. C. Vogel. Mar 73, 22p
Contract W-31-109-eng-38

Descriptors: (*Uranium 235, Neutron reactions), (*Plutonium 239, Neutron reactions), (*Neutron reactions, *Fast fission), (*Neutron beams, Fast fission), Thermal fission, Burnup, Chemical analysis, Fission products, Nuclear fuels, Plutonium, Quantitative chemical analysis, Rare earths, Uranium, X-ray spectrometers, X-ray spectroscopy, Breeder reactors, Fission yield, Liquid metal cooled reactors, Tritium, Activation detectors, Dielectric track detectors, Dosimetry, Fast neutrons, Fission foil detectors, Irradiation, Neutron dosimetry, Radiation effects.

For abstract, see NSA 28 02, number 02210.

ARH-SA-159/GA PC$3.25/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash.
RE-USE OF AQUEOUS WASTES IN HANFORD CHEMICAL PROCESSING FACILITIES.
G. L. Hanson. 30 Mar 73, 24p CONF-730433-1
Contract AT(45-1)-2130

Descriptors: (*Spent fuels, *Reprocessing), (*Radioactive waste processing, *Liquid wastes), Economics.

For abstract, see NSA 28 03, number 05429.

BLG-472/GA PC$3.25/MF$1.45
Centre d'Etude dc l'Energie Nucleaire, MOL (Belgium).
EVALUATION OF FLUIDIZED BED REACTORS, CONTINUOUS AND IN CASCADE IN THE REWORKING OF NUCLEAR FUEL BY FLUORINATION.
F. Decamps, and R. Harnie. Aug 72, 31p
In French. U.S. Sales Only.

Descriptors: (*Spent fuels, *Reprocessing), (*Uranium dioxide, *Fluorination), Fluidized bed, Gases, Hydrofluoric acid, On-line systems, Solids, Uranium hexafluoride, Uranium tetrafluoride.

For abstract, see NSA 28 02, number 02480.

BNWL-SA-4059/GA PC$4.00/MF$1.45
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
APPLICATION OF GAMMA RAY SPECTROMETRY AS A SUPPLEMENTARY MIST TECHNIQUE.
D. R. Oden, and D. E. Christensen. 1971, 36p
CONF-710977-1
Contract AT(45-1)-1830

Descriptors: (*Plutonium, *Safeguards), (*Spent fuels, *Gamma spectroscopy), Nuclear materials management.

For abstract, see NSA 28 03, number 06456.

BNWL-1695/GA PC$7.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
COBRA IIIC: DIGITAL COMPUTER PROGRAM FOR STEADY STATE AND TRANSIENT THERMAL-HYDRAULIC ANALYSIS OF ROD BUNDLE NUCLEAR FUEL ELEMENTS.
D. S. Rowe. Mar 73, 104p
Contract AT(45-1)-1830

Descriptors: (*Computer codes, *C codes), (*Fuel element clusters, *Heat transfer), (*Water cooled reactors, Fuel element clusters), Enthalpy, Hydraulics, Hydrodynamics, Liquid flow, Reactor safety, Steady flow, Transients.

For abstract, see NSA 28 03, number 07436.

BNWL-tr-82/GA PC$3.50/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
IRRADIATION OF URANIUM OXIDE IN STRONG CLADDING. EFFECT OF INITIAL DIAMETRAL GAP ON OVERALL BEHAVIOR. PROGRAM CC-7, 1ST AND 2ND SECTIONS.
J. C. Janvier, B. de Bernardy de Sigoyer, and R. Delmas. 15 May 73, 30p
Translation by E.R. Appleby of CEA-R--3358.

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Fuel elements, *Performance testing), Burnup, Irradiation, Recrystallization, Thermal conductivity, Thermal expansion, Zircaloy-2.

For abstract, see NSA 28 03, number 07502.

CEA-CONF-2140/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
FUEL--COOLANT INTERACTIONS: EXPERIMENTAL STUDIES AND THEORETICAL APPLICATION IN THE CASE OF FAST REACTORS.
M. Amblard, P. Syrmalenios, and J. Costa. 1972, 27p CONF-721006-5
In French. U.S. Sales Only.

Descriptors: (*Sodium cooled reactors, *Fuel-coolant interactions), (*Fbr type reactors, Fuel-coolant interactions), Fuel cans, Fuel elements, Sodium, Stainless steels, Uranium dioxide.

For abstract, see NSA 28 03, number 07324.

CEA-CONF-2145/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Paris (France).
USE OF LOW- AND MEDIUM-POWER PILES FOR STUDIES OF REACTOR ENGINEERING.
J. Bernot, and F. Rossillon. 1972, 11p CONF-721138-2
In French. U.S. Sales Only.

Descriptors: (*Reactor materials, *Irradiation), (*Research reactors, *Uses), Cost, Gamma radiation, Heating, Materials testing, Performance, Planning, Reactor operation, Testing.

For abstract, see NSA 28 03, number 07357.

CEA-CONF-2205/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires. Societe le Carbone Lorraine, Paris (France).
CHARACTERIZATION OF GRAPHITE POWDERS. IRRADIATION BEHAVIOR OF FUEL COMPACTS IN HIGH TEMPERATURE REACTORS.
P. Mottot, and J. Fourre. 9p CONF-720609-10
In French. U.S. Sales Only.

Descriptors: (*Graphite, *Powders), (*Fuel pellets, *Coatings), Chemical properties, Crystal structure, Particle size, Physical radiation effects, Production, Stability, Texture.

For abstract, see NSA 28 02, number 03318.

CEA-CONF-2219/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
CORROSION PRODUCT ACTIVITY IN THE PRIMARY COOLANT WATER OF THE CHOOZ REACTOR.
G. Frejaville, M. Lott, and A. Marchal. 15p CONF-721018-14
In French. U.S. Sales Only.

Descriptors: (*Ardennes reactor, *Primary coolant circuits), Corrosion products, Deposits, Radioactivation, Reactor operation, Reactor shutdown, Water.

For abstract, see NSA 28 02, number 04495.

CEA-R-3501(3)/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.
MANUFACTURE OF THE FIRST CORE OF RAPSODIE. PART III. SPECIAL TECHNICAL PROBLEMS.
Y. Masselot, S. Bataller, M. Ganivet, H. Guillet, and A. Robillard. Mar 73, 38p EUR-3862(3)
In French. U.S. Sales Only.

Descriptors: (*Rapsodie reactor, *Fuel elements), Fabrication, Phase diagrams, Plutonium oxides, Reactor cores, Uranium dioxide.

For abstract, see NSA 28 03, number 07325.

CONF-730326-1/GA PC$4.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Reactors Div. Division of Reactor Development and Technology (Aec), Washington, D.C.
STATUS OF SODIUM CLEANING PROCESSES IN THE LMFBR PROGRAM, USA.
G. R. Taylor, E. C. Bishop, M. H. Cooper, and P. Perrone. 1973, 37p
Contract AT(11-1)-3045

Descriptors: (*Sodium, *Cleaning), (*Sodium cooled reactors, *Reactor components), (*Fbr type reactors, Reactor components), Alcohols, Efficiency, Nitrogen, Steam.

For abstract, see NSA 28 03, number 07326.

CONF-730330-1/GA PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn.
NUCLEAR FUEL CYCLE.
R. E. Brooksbank. 1973, 41p

Descriptors: (*Fuel cycle, *Reviews), Nuclear materials management, Reactors, Regulations, Safety.

For abstract, see NSA 28 03, number 07503.

CONF-730507-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
RESIN FUEL PARTICLES FOR HIGH-TEMPERATURE GAS-COOLED REACTORS.
M. D. Silverman, and C. B. Pollock. 1972, 4p

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Fabrication), Carbonization, Fuel pellets, Heat treatments, Resins, Spheres, Stability, Uranium carbides, Uranium dioxide, Uranium trioxide.

For abstract, see NSA 28 03, number 07286.

CONF-730524-1/GA PC$5.00/MF$1.45
Oak Ridge National Lab., Tenn.
SOL-GEL PROCESSES AT OAK RIDGE NATIONAL LABORATORY: DEVELOPMENT, DEMONSTRATION, AND IRRADIATION TESTS.
R. G. Wymer. 1973, 60p

Descriptors: (*Thorium oxides, *Sol-gel process), (*Uranium dioxide, Sol-gel process), (*Plutonium oxides, Sol-gel process), (*Uranium trioxide, Sol-gel process), Amines, Calcination, Carbon, Chemical preparation, Chemical properties, Coated fuel particles, Dispersions, Drying, Flowsheets, Fuel cans, Htgr type reactors, Material balance, Particle size, Physical properties, Physical radiation effects, Powders, Reaction kinetics, Reviews, Solvent extraction, Spheres, Uranium 233.

For abstract, see NSA 28 03, number 06128.

CONF-730601-4/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
RESIN FUEL PARTICLES FOR HIGH-TEMPERATURE GAS-COOLED REACTORS.
M. D. Silverman, and C. B. Pollock. 1972, 8p

Descriptors: (*Fuel particles, *Sample preparation), (*Uranium, Sample preparation), Absorption, Carbonization, Chemical composition, Htgr type reactors, Ion exchange materials, Resins.

For abstract, see NSA 28 02, number 03020.

CONF-730602-1/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
CURIUM-244 ISOTOPIC POWER FUEL: CHEMICAL RECOVERY FROM COMMERCIAL POWER REACTOR FUELS.
J. C. Posey. 1973, 35p

Descriptors: (*Curium 244, *Isotope production), (*Curium, *Ion exchange), (*Rare earths, Ion exchange), (*Curium oxides, *Production), Reprocessing, Solvent extraction, Spent fuels.

For abstract, see NSA 28 03, number 05417.

DOCKET-701292-5/GA PC$3.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
FUELS FABRICATION PLANT. PRECONSTRUCTION SUBMITTAL.
12 Jan 73, 13p

Descriptors: (*Fuel fabrication plants, *Licensing), Construction, Criticality, Fabrication, Safety standards.

For abstract, see NSA 28 03, number 05452.

DP-Report-610(Pt.1)/GA PC$4.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
ORNL SOL-GEL COATED PARTICLE FUEL IRRADIATION IN DRAGON SECOND CHARGE. PART I. PREPARATION, CHARACTERISATION, AND IRRADIATION. DRAGON PROJECT.
R. L. Beatty, W. D. Bond, and S. D. Clinton. Feb 69, 39p
U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Fabrication), (*Thorium oxides, Fabrication), Coated fuel particles, Dragon reactor, Physical radiation effects, Pyrolytic carbon, Very high temperature.

For abstract, see NSA 28 02, number 03024.

DP-Report-614/GA PC$3.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
OPERATIONAL DATA FOR CHARGE II. DRAGON PROJECT.
C. Hunt, and L. J. Poston. Feb 69, 31p
U.S. Sales Only.

Descriptors: (*Dragon reactor, *Reactor cores), Data acquisition, Fuel elements, Irradiation, Kdf computers, Magnetic tapes, Performance, Reactor fueling, Reactor operation.

For abstract, see NSA 28 03, number 07287.

DP-Report-646/GA PC$5.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
IRRADIATION DATA ON GILSOCARBON GRAPHITES FOR HIGH TEMPERATURE NUCLEAR REACTORS.
R. Blackstone, L. W. Graham, M. R. Everett, and W. Delle. Apr 69, 56p CONF-690620-6
U.S. Sales Only.

Descriptors: (*Graphite, *Physical radiation effects), Creep, Fast neutrons, High temperature, Mechanical properties, Very high temperature.

For abstract, see NSA 28 03, number 06381.

DP-Report-654/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
X-RAYS ABSORPTION CORRECTIONS FOR BACON ANISOTROPY FACTOR MEASUREMENTS ON PYC. DRAGON PROJECT.
G. Tassone. Aug 69, 19p
U.S. Sales Only.

Descriptors: (*Pyrolytic carbon, *Anisotropy), Absorption, Equations, Grain orientation, Measuring methods, X radiation.

For abstract, see NSA 28 02, number 03320.

DP-Report-659/GA PC$4.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
DIMENSIONAL AND PHYSICAL PROPERTY CHANGES OF GRAPHITE SPECIMENS IRRADIATED IN DRAGON FUEL ELEMENT 701. DRAGON PROJECT.
R. Manzel. Oct 69, 52p
U.S. Sales Only.

Descriptors: (*Dragon reactor, Graphite), (*Graphite, *Physical radiation effects), Fast neutrons, Fuel elements, Irradiation, Physical properties, Shrinkage.

For abstract, see NSA 28 02, number 04503.

DP-Report-665/GA PC$4.50/MF$1.45
Atomic Energy Establishment, Winfrith (England).
HIGH TEMPERATURE RADIATION INDUCED CREEP IN GRAPHITE. DRAGON PROJECT.
R. Blackstone, L. W. Graham, and M. R. Everett. Oct 69, 50p CONF-690627-3
U.S. Sales Only.

Descriptors: (*Graphite, *Physical radiation effects), Creep, Hfr reactor, High temperature, Neutron beams, Pile neutrons, Very high temperature.

For abstract, see NSA 28 03, number 06382.

DP-Report-673/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
DRAGON PROJECT PROGRAMME OF CORE MATERIALS DEVELOPMENT FOR HIGH TEMPERATURE POWER REACTORS. DRAGON PROJECT.
R. A. U. Huddle. Oct 69, 17p CONF-691140-4
U.S. Sales Only.

Descriptors: (*Htgr type reactors, *Graphite moderator), (*Dragon reactor, Graphite moderator), (*Reactor materials, *Research programs), Coated fuel particles, Design, Fabrication, Fuel rods, Performance testing, Reactor cores, Solid fuels.

For abstract, see NSA 28 03, number 07290.

DP-Report-679/GA PC$4.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
PREIRRADIATION TESTING OF HTR FUELS. DRAGON PROJECT.
J. Holliday, S. E. Hammond, J. Hedderly, P. D. Frampton, and T. Goergenyi. Oct 69, 51p CONF-691140-3
U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Testing), (*Uranium carbides, Testing), (*Thorium carbides, Testing), (*Coated fuel particles, Testing), Carbon, Fabrication, Fillers, Graphite, Htr reactor.

For abstract, see NSA 28 03, number 06130.

DP-Report-686/GA PC$3.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).
IRRADIATION BEHAVIOUR OF COATED PARTICLE FUEL COMPACTS. DRAGON PROJECT.
M. R. Everett, R. Manzel, P. Barr, and K. Mayr.
Oct 69, 23p CONF-691140-1
U.S. Sales Only.

Descriptors: (*Plutonium carbides, *Physical radiation effects), (*Thorium carbides, Physical radiation effects), (*Graphite, *Matrix materials), (*Coated fuel particles, Physical radiation effects), Compacts, Neutron beams.

For abstract, see NSA 28 03, number 06131.

DP-Report-699/GA PC$4.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
GRAPHITE MATERIALS DATA FOR HIGH TEMPERATURE NUCLEAR REACTORS. DRAGON PROJECT.
M. R. Everett, R. Blackstone, L. W. Graham, and R. Manzel. Dec 69, 36p CONF-700407-3
U.S. Sales Only.

Descriptors: (*Coated fuel particles, *Physical radiation effects), (*Fuel elements, Physical radiation effects), (*Graphite moderator, Physical radiation effects), (*Graphite, *Matrix materials), Compacts, High temperature, Neutron beams, Pyrolytic carbon, Resins, Very high temperature.

For abstract, see NSA 28 03, number 06383.

DUN-8056(Rev.1)/GA PC$3.25/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash.
SETUP AND ADJUSTMENT PROCEDURES FOR THE NONDESTRUCTIVE TESTERS N FUELS PRODUCTION DIVISION.
19 Mar 73, 23p

Descriptors: (*N-reactor, Fuel elements), (*Fuel elements, Ultrasonic testing), (*Ultrasonic testing, Fuel elements), Fuel cans, Thickness, Welded joints.

For abstract, see NSA 28 03, number 05480.

EUR-4772/GA PC$5.45/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
FLUIDIZED BED COATING OF NUCLEAR FUEL PARTICLES TOWARDS INDUSTRIAL SCALE OPERATIONS. PROCEEDINGS OF THE FIRST COLLOQUIUM, ISPRA, ITALY, APRIL 29, 1971.
J. Flamm, and D. Van Velzen. May 72, 62p CONF-710465-
U.S. Sales Only.

Descriptors: (*Coated fuel particles, *Fabrication), Cost, Efficiency, Fluidized bed, Meetings, Research programs.

For abstract, see NSA 28 03, number 06132.

EUR-4927/GA PC$3.00/MF$1.45
European Atomic Energy Community, Karlsruhe (West Germany). Inst. Of Transuranium Elements.
AUTOMATIC DEVICE FOR SEPARATION OF URANIUM AND PLUTONIUM FROM SPENT NUCLEAR FUEL BY ION EXCHANGERS FOR MASS SPECTROMETRY.
D. Bol, B. Brandalise, A. Bier, M. De Rossi, and L. Koch. Mar 73, 15p
In German. U.S. Sales Only.

Descriptors: (*Uranium, *Ion exchange), (*Plutonium, Ion exchange), (*Spent fuels, *Chemical analysis), (*Uranium isotopes, *Mass spectroscopy), Automation, Plutonium isotopes, Separation processes.

For abstract, see NSA 28 02, number 02157.

EURFNR-1032/GA PC$5.45/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
RECOVERY PROCESSES IN THE OXYGEN SUBLATTICE OF QUENCHED AND NEUTRON-IRRADIATED URANIUM DIOXIDE.
D. Vollath. Jun 72, 45p KFK-1621

Descriptors: (*Uranium dioxide, *Physical radiation effects), Annealing, Crystal lattices, Diffusion, Frenkel defects, High temperature, Neutron beams, Oxygen, Quenching.

For abstract, see NSA 28 02, number 03026.

EURFNR-1048/GA PC$5.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
CALCULATION OF STRESSES AND STRAINS IN DOUBLY CONNECTED PRISMATIC BODIES WITH SAMPLE CALCULATIONS FOR AN AXIALLY FINNED FUEL CLAD.
R. Krieg. Oct 72, 58p KFK-1665

Descriptors: (*Computer codes, *E codes), (*Fuel cans, *Stress analysis), Differential equations, Fins, Fuel pins, Power series, Strains.

For abstract, see NSA 28 02, number 04640.

EURFNR-1066/GA PC$11.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
DESIGN, IRRADIATION, AND POST-IRRADIATION EXAMINATION OF THE UO SUB 2 /PUO SUB 2 FUEL PIN BUNDLE MOL-7A.
K. Kummerer, D. Geithoff, and P. Weimar. Nov 72, 192p KFK-1522

Descriptors: (*Fbr type reactors, Fuel pins), (*Sodium cooled reactors, Fuel pins), (*Fuel pins, *Performance testing), Design, Fabrication, Fuel element clusters, Irradiation, Plutonium oxides, Uranium dioxide.

For abstract, see NSA 28 02, number 04534.

EURFNR-1068/GA PC$5.45/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
VELOCITY AND TEMPERATURE FIELDS IN FUEL ROD BUNDLES OF SYMMETRICAL AND ASYMMETRICAL GEOMETRY.
F. Hofmann. Jan 73, 89p KFK-1633

Descriptors: (*Snr reactor, Fuel element clusters), (*Fuel element clusters, *Heat transfer), (*Fbr type reactors, Fuel element clusters), (*Sodium cooled reactors, Fuel element clusters), Disturbances, Fuel cans, Reactor cooling systems, Sodium, Temperature dependence, Turbulent flow, Velocity.

For abstract, see NSA 28 02, number 04535.

EURFNR-1070/GA PC$5.45/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
MECHANICAL BEHAVIOR ANALYSIS OF SUBASSEMBLY BOXES SUBJECT TO MATERIAL CREEP AND SWELLING.
R. Liebe. Dec 72, 77p KFK-1724

Descriptors: (*Snr reactor, Fuel elements), (*Fuel elements, *Deformation), (*Fbr type reactors, Fuel elements), (*Computer codes, *B codes), Creep, Irradiation, Physical radiation effects, Reactor cores, Strains, Stresses, Swelling, Thermal expansion.

For abstract, see NSA 28 02, number 04536.

EURFNR-1074/GA PC$4.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
BREDA: A COMPUTER MODEL FOR THE DEFORMATION OF A SODIUM-COOLED FAST BREEDER FUEL PIN UNDER TRANSIENT LOAD.
B. Kuczera. Dec 72, 51p KFK-1729

Descriptors: (*Fbr type reactors, Fuel pins), (*Sodium cooled reactors, Fuel pins), (*Fuel pins, *Deformation), (*Computer codes, *B codes), Performance, Reactor accidents, Transients.

For abstract, see NSA 28 03, number 07329.

EURFNR-1076/GA PC$5.45/MF$1.45
Reactor Centrum Nederland, Petten.
POST-IRRADIATION EXAMINATION OF FUEL PIN R54-F20/SUP A/, IRRADIATED IN A NAK ENVIRONMENT.
H. Kwast. Dec 72, 66p RCN-181

Descriptors: (*Nak cooled reactors, Fuel pins), (*Fuel pins, *Irradiation), Aluminium oxides, Failed element detection, Fuel cans, Gamma fuel scanning, Hfr reactor, Highly enriched uranium, Irradiation capsules, Irradiation procedures, Potassium alloys, Power density, Sodium alloys, Temperature measurement, Thermal neutrons, Uranium borides, Uranium dioxide.

For abstract, see NSA 28 02, number 04537.

GEAP-12268/GA PC$5.45/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
TRANSPORT AND REACTION OF CS, TE, I, AND MO WITH FAST REACTOR FUEL AND STAINLESS STEEL CLADDING. I.
E. A. Aitken, S. K. Evans, B. F. Rubin, and T. E. Ludlow. Nov 72, 58p
Contract AT(04-3)-893

Descriptors: (*Fast reactors, *Fuel-cladding interactions), (*Fuel pins, Fuel-cladding interactions), Cesium oxides, Diffusion, Fission products, Fuel cans, Iodine, Molybdenum, Stainless steel-316, Tellurium.

For abstract, see NSA 28 03, number 07504.

GEAP-12368/GA PC$4.00/MF$1.45
General Electric CO., Pleasanton, Calif. Vallecitos Nuclear Center.
THERMODYNAMIC DATA PROGRAM INVOLVING PLUTONIA AND URANIA AT HIGH TEMPERATURES. QUARTERLY REPORT NO. 21, AUGUST 1, 1972--OCTOBER 31, 1972.
E. A. Aitken, D. Dutina, M. G. Adamson, S. K. Evans, and T. E. Ludlow. Nov 72, 13p
Contract AT(04-3)-893

Descriptors: (*Sodium cooled reactors, *Fuel elements), (*Fbr type reactors, Fuel elements), Plutonium oxides, Uranium oxides, Fission products, Fuel cans, Fuel-cladding interactions, Stainless steels, Tellurium, Chemical reactions, Fuel-coolant interactions, Sodium.

For abstract, see NSA 28 02, number 04538.

GEAP-12389/GA PC$3.75/MF$1.45
General Electric CO., Pleasanton, Calif. Vallecitos Nuclear Center.
THERMODYNAMIC DATA PROGRAM INVOLVING PLUTONIA AND URANIA AT HIGH TEMPERATURES. QUARTERLY REPORT NO. 22, NOVEMBER 1, 1972--JANUARY 31, 1973.
E. A. Aitken, D. Dutina, M. G. Adamson, S. K. Evans, and T. E. Ludlow. Feb 73, 32p
Contract AT(04-3)-893

Descriptors: (*Sodium cooled reactors, *Fuel elements), (*Fbr type reactors, Fuel elements), (*Fuel-coolant interactions, *Sodium), (*Oxygen, *Adsorption), Fuel cans, Plutonium oxides, Uranium oxides, Chemical reactions, Fission products, Fuel-cladding interactions, Stainless steels, Tellurium, Metals.

For abstract, see NSA 28 03, number 07331.

GEAP-13925/GA PC$5.25/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
CAPSULE B9D IRRADIATION AND POST-IRRADIATION EXAMINATION.
P. E. Bohaboy, C. N. Craig, G. L. Stimmell, J. J. Regimbal, and P. E. Novak. Dec 72, 61p
Contract AT(04-3)-189

Descriptors: (*Fuel elements, *Failures), (*Sodium cooled reactors, Fuel elements), (*Fbr type reactors, Fuel elements), Antimony 125, Cesium 137, Defects, Fuel-cladding interactions, Fuel-coolant interactions, Iodine 131, Physical radiation effects, Plutonium oxides, Strontium 90, Uranium dioxide.

For abstract, see NSA 28 03, number 07333.

GEAP-13935/GA PC$4.00/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
STOICHIOMETRY EFFECTS ON INTEGRAL KDTHETA OF (PU,U)O/SUB 2-X/ IN PILE.
D. A. Cantley, B. F. Rubin, and C. N. Craig. Jan 73, 50p
Contract AT(04-3)-893

Descriptors: (*Uranium dioxide, *Thermal conductivity), (*Plutonium oxides, Thermal conductivity), (*Fbr type reactors, *Fuel rods), (*Sodium cooled reactors, Fuel rods), Grain growth, Irradiation, Melting, Microstructure, Neutron flux, Physical radiation effects, Stoichiometry, Thermal neutrons.

For abstract, see NSA 28 03, number 07334.

GERHTR-42/GA PC$6.50/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Chemische Technologie.
REPROCESSING OF THORIUM-CONTAINING NUCLEAR FUELS. REPORT ON ACTIVITIES IN THE FIRST HALF YEAR 1970.
Aug 70, 87p

Descriptors: (*Spent fuels, *Reprocessing), (*Radioactive waste processing, *Solidification), Hot cells, Research programs, Thorex process, Thorium.

For abstract, see NSA 28 02, number 02481.

GU-5292/GA PC$5.50/MF$1.45
Gulf United Nuclear Fuels Corp., Elmsford, N.Y.
MECHANICAL DESIGN OF THE DRESDEN 1 MIXED-OXIDE DEMONSTRATION ASSEMBLIES.
M. P. LaBar. Mar 73, 68p
Contract AT(11-1)-2210

Descriptors: (*Dresden-1 reactor, *Fuel assemblies), (*Plutonium, *Fuel cycle), (*Bwr type reactors, Fuel cycle), Design, Fuel shuffling, Plutonium oxides, Reactor fueling, Reprocessing, Specifications, Spent fuels, Uranium dioxide.

For abstract, see NSA 28 03, number 07259.

HEDL-SA-434/GA PC$4.00/MF$1.45
Westinghouse Hanford CO., Richland, Wash. (Usa).
SHIELDED ELECTRON MICROPROBE ANALYSIS OF IRRADIATED MIXED OXIDE FUELS.
E. D. Jenson. 40p CONF-721025-14

Descriptors: (*Fuel pins, *Chemical analysis), (*Uranium, *Quantitative chemical analysis), (*Plutonium, Quantitative chemical analysis), (*Molybdenum, Quantitative chemical analysis), Cesium, Electron probes, Fission products, Fuel cans, Xenon.

For abstract, see NSA 28 02, number 02159.

HEDL-TME-72-106/GA PC$5.45/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
FAST FLUX TEST FACILITY COUPON SURVEILLANCE PROGRAM.
R. A. Moen. Dec 72, 103p
Contract AT(45-1)-2170

Descriptors: (*Fftf reactor, Reactor components), (*Fbr type reactors, Reactor components), (*Sodium cooled reactors, Reactor components), (*Reactor components, *Physical radiation effects), Inspection, Irradiation, Performance testing, Reactor materials, Time dependence.

For abstract, see NSA 28 03, number 07361.

ICP-1019/GA PC$3.00/MF$1.45
Allied Chemical Corp., Idaho Falls, Idaho. Idaho Chemical Programs Operations Office.
FIRST NEPTUNIUM PROCESSING CAMPAIGN AT ICPP.
J. E. Johnson, L. C. Lewis, M. E. Jacobson, and M. K. Valentine. Feb 73, 29p
Contract AT(10-1)-1375

Descriptors: (*Neptunium, *Solvent extraction), (*Uranium, Solvent extraction), (*Plutonium, Solvent extraction), (*Spent fuels, *Reprocessing), Ketones, Oxidation.

For abstract, see NSA 28 02, number 02482.

IFA-FR-96-1972/GA PC$3.00/MF$1.45
Institutul de Fizica Atomica, Bucharest (Romania).
OBSERVATION OF A CLADDING FAILURE BY FISSION PRODUCT GASES FROM THE COOLANT.
R. Vidrighin, E. Ionescu, and Z. Alexan. 1972, 8p
U.S. Sales Only.

Descriptors: (*Fuel elements, *Failed element detection), Coolants, Fission products, Gases, Monitoring.

For abstract, see NSA 28 02, number 04641.

INDC(NDS)-50-U+S/GA PC$4.50/MF$1.45
International Nuclear Data Committee.
REQUEST LIST OF NUCLEAR DATA FOR SAFEGUARDS DEVELOPMENT PURPOSES AS SUBMITTED TO THE INTERNATIONAL ATOMIC ENERGY AGENCY BY MEMBER STATES.
T. A. Byer. Mar 73, 48p
U.S. Sales Only.

Descriptors: (*Safeguards, *Qualitative chemical analysis), Fissionable materials, Iaea, Nuclear materials management, Usa, Ussr.

For abstract, see NSA 28 03, number 06457.

IS-3054/GA PC$3.25/MF$1.45
Ames Lab., Iowa.
FABRICATION OF ALUMINUM SHEATHED, ENRICHED UO SUB 2 –ALUMINUM MIXED POWDER NUCLEAR FUEL ELEMENTS BY COEXTRUSION.
C. V. Owen, T. E. Scott, and W. H. McCorkle. Jan 73, 22p
Contract W-7405-eng-82

Descriptors: (*Uranium dioxide, *Extrusion), (*Aluminium, Extrusion), (*Dispersion nuclear fuels, Extrusion), Composite materials, Fabrication, Fast neutrons, Fuel cans, Hollow fuel rods, Powder metallurgy, Production.

For abstract, see NSA 28 03, number 06133.

JEN-256/GA PC$25.50/MF$1.45
Junta de Energia Nuclear, Madrid (Spain).
MANAGEMENT AND PLANNING OF FUEL ELEMENTS IN LIGHT WATER REACTORS.
G. Velarde, F. Aguilar, C. Ahnert, J. M. Aragones, and A. Bru. 1972, 467p
In Spanish. U.S. Sales Only.

Descriptors: (*Bwr type reactors, *Reactor fueling), (*Pwr type reactors, Reactor fueling), Burnup, Computer codes, Data, Fuel cycle, Nuclear materials management, Numerical solution, Reactor cores, Reactor kinetics.

For abstract, see NSA 28 02, number 04488.

JUL-904-RG/GA PC$4.25/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorentwicklung.
KPD: PRESENT WORTH FUEL CYCLE CALCULATION METHODS AND CODES.
U. Hansen. Dec 72, 41p
U.S. Sales Only.

Descriptors: (*Power reactors, *Fuel cycle), (*Computer codes, *K codes), Cost, Economics, Ibm computers, Nuclear materials management.

For abstract, see NSA 28 02, number 04667.

JUL-921-RG/GA PC$7.00/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorentwicklung.
INVESTIGATIONS ON THE RELEASE BEHAVIOR OF EXP 6 LI FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS ESPECIALLY BY USING SAMPLES OF DIFFERENT SIZE AND MATERIAL PROPERTIES.
N. Neef. Feb 73, 100p
In German. U.S. Sales Only.

Descriptors: (*Beryllium oxides, *Physical radiation effects), Compacts, Lithium 6, Neutron beams, Sintered materials.

For abstract, see NSA 28 03, number 06135.

JUL-923-RW/GA PC$4.25/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorwerkstoffe.
AIM OF GCFR FUEL ELEMENT IRRADIATIONS IN THE HELIUM-LOOP-MOL.
W. Krug, and H. Stehle. Feb 73, 41p
In German. U.S. Sales Only.

Descriptors: (*Fbr type reactors, Fuel elements), (*Gas cooled reactors, Fuel elements), (*Fuel elements, *Performance testing), Irradiation.

For abstract, see NSA 28 02, number 04543.

KFK-1695/GA PC$3.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
EXPECTED MEASUREMENT ACCURACIES AND LIMITS OF ERROR IN A FABRICATION PLANT FOR HIGH ENRICHED URANIUM.
F. Schinzer, D. Gupta, and R. Kraemer. Jan 73, 28p CONF-720840-2
U.S. Sales Only.

Descriptors: (*Highly enriched uranium, *Safeguards), Accuracy, Fabrication, Material balance area, Nuclear materials management.

For abstract, see NSA 28 02, number 03447.

KFK-1723/GA PC$4.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
ISOTHERMAL SODIUM FLOW EXPERIMENTS WITH A MODEL FUEL-ELEMENT COMPOSED OF RODS WITH 6 INTEGRAL FINS AS SPACERS.
E. Baumgaertner, H. U. Borgstedt, and G. Drechsler. Feb 73, 48p
In German. U.S. Sales Only.

Descriptors: (*Fbr type reactors, Fuel assemblies), (*Liquid metal cooled reactors, Fuel assemblies), (*Fuel assemblies, *Liquid flow), (*Sodium, *Corrosion), Configuration, Fins, Fuel rods, Spacers, Testing, Welded joints.

For abstract, see NSA 28 03, number 07337.

KFK-1727/GA PC$8.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
EVALUATION OF THE INVESTIGATION RESULTS ON THE IRRADIATED UO SUB 2 -- PUO SUB 2 FUEL RODS OF THE TEST SERIES FR 2-4A.
W. Dienst, O. Goetzmann, H. Kleykamp, G. Ondracek, and B. Schulz. Jan 73, 125p
In German. U.S. Sales Only.

Descriptors: (*Fuel rods, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Plutonium oxides, Physical radiation effects), Binary mixtures, Burnup, Chemical reactions, Chromium-nickel steels, Cracks, Data, Density, Fission products, Fr-2 reactor, Fuel cans, Gases, Irradiation, Measuring methods, Photomicrography, Porosity, Temperature dependence, Thermal analysis, Voids, Volume.

For abstract, see NSA 28 02, number 04642.

LA-4951/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
THERMAL NEUTRON IRRADIATION OF SODIUM-BONDED SOLID SOLUTION (U,PU)C FUEL.
J. C. Clifford. Feb 73, 34p
Contract W-7405-eng-36

Descriptors: (*Uranium carbides, *Irradiation), (*Plutonium carbides, Irradiation), (*Fuel elements, *Fuel-cladding interactions), Bonding, Burnup, Fuel pellets, Sodium, Stainless steel-316, Thermal neutrons.

For abstract, see NSA 28 02, number 04544.

LA-5197-PR/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NUCLEAR ANALYSIS RESEARCH AND DEVELOPMENT. PROGRAM STATUS REPORT, SEPTEMBER--DECEMBER 1972.
Mar 73, 32p
Contract W-7405-eng-36

Descriptors: (*Nuclear fuels, *Qualitative chemical analysis), (*Radioactive wastes, Qualitative chemical analysis), (*Gamma spectrometers, *Performance), (*Neutron detectors, Performance), Binary mixtures, Delayed neutrons, Design, Fast neutrons, Fuel elements, Fuel pellets, Fuel rods, Gamma radiation, Htgr type reactors, Muons, Nuclear materials management, Plutonium, Plutonium oxides, Research programs, Thermal neutrons, Thorium carbides, Uranium carbides, Uranium dioxide, Uranium hexafluoride, Water cooled reactors.

For abstract, see NSA 28 03, number 06458.

N-72-33652/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
CALCULATION OF RADIATION-INDUCED SWELLING OF UN USING THE DIGITAL COMPUTER PROGRAM CYGRO 2.
H. W. Davison, and I. B. Fiero. Mar 71, 15p
NASA-TM-X-2224

Descriptors: (*Uranium nitrides, *Physical radiation effects), (*Fuel pins, Physical radiation effects), Burnup, C codes, Creep, Niobium base alloys, Swelling, Tantalum alloy-t111.

For abstract, see NSA 28 02, number 03028.

N-72-33653/GA PC$5.45/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
IN-PILE AND OUT-OF-PILE TESTING OF A MOLYBDENUM--URANIUM DIOXIDE CERMET FUELED THERMIONIC DIODE.
D. C. Dilanni. Jan 72, 57p NASA-TM-X-2451

Descriptors: (*Thermionic reactors, Thermionic converters), (*Thermionic converters, *Performance), Cermets, Molybdenum alloys, Sensitivity, Simulation, Snap reactors, Uranium dioxide.

For abstract, see NSA 28 03, number 07382.

N-73-11707/GA PC$4.00/MF$1.45
Jet Propulsion Lab., Pasadena, Calif.
NEUTRON RADIATION CHARACTERISTICS OF PLUTONIUM DIOXIDE FUEL.
M. Taherzadeh. 1 Dec 72, 23p NASA-CR-129098, JPL-TR-32-1555(Rev.1)
Contract NAS7-100

Descriptors: (*Plutonium oxides, *Nuclear reaction yield), (*Neutrons, Nuclear reaction yield), Fission, Irradiation, Neutron flux, Performance, Plutonium.

For abstract, see NSA 28 03, number 07505.

NAA-SR-10188/GA PC$3.25/MF$1.45
Atomics International, Canoga Park, Calif.
DEVELOPMENTAL TESTING SNAP 2 FUEL ELEMENTS.
J. L. Isaacs. 1 Dec 64, 24p
Contract AT(11-1)-Gen-8

Descriptors: (*S2 reactor, *Fuel elements), Design, Impact shock, Mechanical vibrations, Performance, Snap reactors, Testing.

For abstract, see NSA 28 03, number 07393.

N73-27584/4GA PC$8.50/MF$1.45
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
FABRICATION OF CAPSULE ASSEMBLIES, PHASE 3.
Final Report.
A. R. Keeton, and L. G. Stemann. Mar 73, 128p
NASA-CR-121181, WANL-M-FR-73-002
Contract NAS3-15332

Descriptors: *Nuclear fuel elements, *Reactor design, *Space power reactors, Electron beam welding, Nitrides, Uranium compounds.

For abstract, see STAR 1118

N73-27587/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IRRADIATION TEST OF TUNGSTEN CLAD URANIUM CARBIDE-ZIRCONIUM CARBIDE ((U,ZR)C) SPECIMENS FOR THERMIONIC REACTOR APPLICATION AT CONDITIONS CONDUCTIVE TO LONG-TERM PERFORMANCE.
J. W. R. Creagh, and J. R. Smith. Aug 73, 20p
NASA-TM-X-2834, E-7440

Descriptors: *Irradiation, *Thermionic power generation, *Uranium carbides, *Zirconium carbides, Cladding, Radiation shielding, Thermionic emitters, Tungsten.

For abstract, see STAR 1118

N73-27588/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IRRADIATION OF TZM: URANIUM DIOXIDE FUEL PIN AT 1700 K.
G. E. Mcdonald. Jul 73, 19p NASA-TM-X-2755, E-7277

Descriptors: *Irradiation, *Nuclear fuel burnup, *Nuclear fuel elements, *Nuclear reactors, *Uranium oxides, Cladding, Nuclear fuels, Reactor technology, Temperature gradients.

For abstract, see STAR 1118

N73-28662/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NUCLEAR CHARACTERISTICS OF A FISSIONING URANIUM PLASMA TEST REACTOR WITH LIGHT-WATER COOLING.
C. L. Whitmarsh, Jr.. Aug 73, 20p NASA-TM-X-2864, E-7455

Descriptors: *Fast test reactors, *Nuclear fuels, *Power efficiency, *Reactor design, *Water cooled reactors, Reaction control, Reactor technology.

For abstract, see STAR 1119

N73-28663/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CALCULATED POWER DISTRIBUTION OF A THERMIONIC, BERYLLIUM OXIDE REFLECTED, FAST-SPECTRUM REACTOR.
W. Mayo, and E. Lantz. Aug 73, 17p NASA-TM-X-2838, E-7443

Descriptors: *Beryllium oxides, *Fast nuclear reactors, *Flux density, *Nuclear fuel elements, Neutron spectra, Power spectra, Thermionic power generation.

For abstract, see STAR 1119

ORNL-TM-4139/GA PC$5.25/MF$1.45
Oak Ridge National Lab., Tenn.
EXAMINATION OF THE IRRADIATED 6061 ALUMINUM HFIR TARGET HOLDER.
K. Farrell, R. T. King, and A. Jostsons. May 73, 65p
Contract W-7405-eng-26

Descriptors: (*Hfir reactor, *Targets), (*Aluminium alloys, *Physical radiation effects), Fast neutrons, Irradiation, Supports, Tensile properties, Thermal neutrons.

For abstract, see NSA 28 02, number 04570.

ORNL-4856/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
IRRADIATION BEHAVIOR OF ALUMINUM-BASE FUEL DISPERSIONS.
M. M. Martin, A. E. Richt, and W. R. Martin. May 73, 65p
Contract W-7405-eng-26

Descriptors: (*Hfir reactor, *Fuel plates), (*Atr reactor, Fuel plates), Aluminium base alloys, Canning, Dispersion nuclear fuels, Irradiation, Performance testing, Physical radiation effects, Swelling, Uranium alloys, U3o8.

For abstract, see NSA 28 03, number 07371.

ORO-4212-14/GA PC$4.00/MF$1.45
Florida Univ., Gainesville. Engineering and Industrial Experiment Station.
QUANTITATIVE DETERMINATION OF THE STRUCTURE--PROPERTY RELATIONSHIPS IN NUCLEAR FUEL ELEMENT MATERIALS. QUARTERLY PROGRESS REPORT, OCTOBER 1, 1972--DECEMBER 31, 1972.
F. N. Rhines, R. T. DeHoff, and E. D. Whitney.
Feb 73, 37p
Contract AT(40-1)-4212

Descriptors: (*Uranium dioxide, *Mechanical properties), (*Nickel, Mechanical properties), (*Copper, *Sintered materials), Density, Isother-

mal processes, Microscopy, Microstructure, Permeability, Physical properties, Sample preparation, Sintering, Stresses.

For abstract, see NSA 28 02, number 03029.

PATENT-3 725 293/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
CONVERSION OF FUEL-METAL NITRATE SOLUTIONS TO OXIDES.
Patent,
Paul A. Haas. Filed 11 Jan 72, patented 3 Apr 73, 4p PAT-APPL-217 038
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Inorganic nitrates, *Reduction(Chemistry)), (*Patents, Reduction(Chemistry)), (*Nuclear fuels, Chemical reactions), Oxides, Uranium dioxide, Plutonium dioxide.
Identifiers: PAT-CL-252-301-R.

The invention can be summarized as follows: An aqueous nuclear fuel metal nitrate solution is converted to a fuel-metal oxide comprising the steps of (a) adding an aqueous-soluble nitrate-reducing material selected from the group consisting of hydroxylated organic compounds and hydrazine to said nitrate solution, (b) maintaining the resulting solution at an elevated temperature under pressure until said fuel-metal oxide is precipitated, and (c) recovering the precipitated fuel-metal oxide.

PATENT-3-733 249/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
METHOD FOR DETECTING AND MONITORING A FUEL ELEMENT FAILURE IN A NUCLEAR REACTOR.
Patent,
William E. Miller, and William J. Mecham. Filed 2 Nov 71, patented 15 May 73, 5p PAT-APPL-194 963
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Nuclear fuel elements, Failure), (*Patents, Nuclear fuel elements), Nuclear fuel claddings, Fission productors, Breeder reactors, Detectors.
Identifiers: PAT-CL-176-19-LD.

The patent describes a method for detecting a fuel element failure in a liquid-sodium-cooled fast breeder reactor and for monitoring the progression thereof, wherein the failure causes sodium coolant to contact the fuel oxide, which comprises determining the level of 135I activity in the liquid sodium resulting from the failed fuel element by separating and counting its daughter 135mXe, using an inert gas sparge.

PATENT-3 740 314/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
FUEL PIN FOR A LIQUID-METAL-COOLED FAST-BREEDER NUCLEAR REACTOR.
Patent,
Lawrence A. Neimark. Filed 28 Jan 72, patented 19 Jun 73, 4p PAT-APPL-221 745
Government-owned invention avialable for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Nuclear fuel pins, *Patents), Breeder reactors, Liquid metal cooled reactors, Failure, Nuclear reactor safety.
Identifiers: PAT-CL-176-68.

The patent describes an inherently safe fuel pin for a liquid-metal-cooled fast-breeder nuclear reactor. It is designed so that axial movement of molten fuel is enhanced and return of the molten fuel to the fuel zone is prevented if a sudden reactivity insertion causes melting of the fuel. The fuel pin includes an annular upper blanket separated from a solid fuel zone by a conical nozzle the upper nose of which is welded into a grid plate which extends across the fuel pin and supports the annular upper blanket. Molten fuel is ejected into the central opening, of the annular blanket through the conical nozzle which also prevents molten fuel from reentering the fuel zone.

RCN-179/GA PC$3.25/MF$1.45
Reactor Centrum Nederland, Petten.
INFLUENCE OF ECCENTRIC ASSEMBLY CLEARANCE ON THE PERFORMANCE OF INDIRECTLY HEATED PINS.
V. Vonka, and H. D. de Jong. Jan 73, 25p
U.S. Sales Only.

Descriptors: (*Fuel pins, *Simulation), (*Sodium cooled reactors, Fuel pins), (*Heaters, *Performance), Asymmetry, Computer calculations, Cylindrical configuration, Fuel element clusters, Heat resisting alloys, Heat transfer, High temperature, Liquid metals, Performance, Resistors, Sodium, Stainless steel-304, Thermodynamic properties.

For abstract, see NSA 28 03, number 07506.

RD/B/N-1729/GA PC$3.75/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
METAL COOLANT THERMAL INTERACTIONS AT HIGH TEMPERATURES: A STUDY OF THE TRANSIENT ENERGY TRANSFER PROCESSES.
S. J. Board, A. J. Clare, R. B. Duffey, R. S. Hall, and D. H. Poole. Jun 70, 35p
U.S. Sales Only.

Descriptors: (*Fbr type reactors, *Fuel-coolant interactions), (*Sodium cooled reactors, Fuel-coolant interactions), Energy transfer, Explosions, High temperature, Reaction kinetics, Reactor safety, Sodium, Transients.

For abstract, see NSA 28 03, number 07427.

RD/B/N-2473/GA PC$3.75/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
EXAMINATION OF BURNABLE POISON DEPLETION IN WAGR.
A. J. Beynon, and T. Gavan. Nov 72, 31p
U.S. Sales Only.

Descriptors: (*Wagr reactor, *Burnable poisons), A codes, Burnup, Computer codes, D codes, Fine structure, Fuel elements, Gadolinium, Gadolinium isotopes, P codes, Reactivity, Self-shielding.

For abstract, see NSA 28 03, number 07297.

RT/ING-(72)13/GA PC$8.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
GUIDE TO KNOWLEDGE OF ITREC AND THE PCUT PROGRAM.
17 Jul 72, 124p
In Italian. U.S. Sales Only.

Descriptors: (*Spent fuels, *Reprocessing), Fuel cycle, Heavy water cooled reactors.

For abstract, see NSA 28 03, number 05435.

SRARI-P-174/GA PC$3.00/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
CALIFORNIUM-252 BUILD-UP IN THE CENTRAL CHANNEL OF THE SM-2 REACTOR.
V. D. Gavrilov, Yu. S. Zamyatnin, V. V. Ivanenko, and G. N. Yakovlev. 1972, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Californium 252, *Nuclear reaction yield), (*Plutonium 242, *Irradiation), (*Americium 243, Irradiation), Buildup, Neutron spectra, Reactor cores, Sm-2 reactor, Spectral hardening.

For abstract, see NSA 28 02, number 04571.

SRARI-P-177/GA PC$3.00/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
STRUCTURE FORMATION AND GAS RELEASE IN UO SUB 2 FUEL ELEMENTS.
B. V. Samsonov, V. V. Sidorov, and Yu. G. Spiridonov. 1972, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Fuel elements, *Performance), Chemical reactions, Fission products, Gases, Reactor operation, Uranium dioxide.

For abstract, see NSA 28 03, number 07507.

TIM-767/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-41.
A. C. Loethen, F. F. Felber, and J. E. Frank. 23 Sep 63, 10p

Descriptors: (*Beryllium oxides, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), Burnup, Fission products, Fuel cans, Gases, Nuclear fuels, Stability, Very high temperature.

For abstract, see NSA 28 02, number 03034.

TIM-767(Suppl.1)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-42.
J. E. Frank, and F. F. Felber. 17 Oct 63, 12p

Descriptors: (*Beryllium oxides, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), Fission products, Fuel cans, Nuclear fuels, Stability.

For abstract, see NSA 28 02, number 03035.

TIM-769/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-15.
J. E. Frank, and F. F. Felber. 10 Oct 63, 9p

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Beryllium oxides, Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), Burnup, Fission products, Fuel cans, Gases, Helium, Nuclear fuels, Very high temperature.

For abstract, see NSA 28 02, number 03036.

TIM-769(Suppl.1)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-18.
J. E. Frank, and F. F. Felber. 17 Oct 63, 8p

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Beryllium oxides, Physical radiation effects), (*Niobium base alloys, Physical

radiation effects), (*Zirconium alloys, Physical radiation effects), Burnup, Fission products, Fuel cans, Gases, Helium, Nuclear fuels, Very high temperature.

For abstract, see NSA 28 02, number 03037.

TIM-781(Suppl.1)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IN-PILE CAPSULE DESIGN REPORT FOR UN FUEL ELEMENT SPECIMENS (TYPE 18B) OPERATING AT 2200F AND 0.40 KW/CC (80% A - 20% HE).
E. N. Butler, and K. R. Thoms. 10 Feb 64, 17p
Contract AT(30-1)-2789

Descriptors: (*Irradiation capsules, *Design), (*Niobium base alloys, *Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Uranium nitrides, Physical radiation effects), Lithium, Nuclear fuels, Stainless steels, Testing, Tungsten, Zirconium.

For abstract, see NSA 28 02, number 03157.

TIM-788/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-150.
J. E. Frank, F. F. Felber, and A. C. Loethen. 16 Dec 63, 18p

Descriptors: (*Uranium carbides, *Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), Burnup, Fuel cans, Fuel elements, Layers, Tantalum, Very high temperature.

For abstract, see NSA 28 02, number 03038.

TIM-788(Suppl.1)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-150C.
J. E. Frank, F. F. Felber, and A. C. Loethen. 16 Dec 63, 11p

Descriptors: (*Uranium carbides, *Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Nuclear fuels, Physical radiation effects), Fuel cans, Tantalum, Tantalum carbides, Very high temperature.

For abstract, see NSA 28 02, number 03039.

TIM-855(Suppl.10)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-521.
A. C. Loethen, and H. W. Ferry. 21 May 65, 3p

Descriptors: (*Uranium carbides, *Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Tantalum, Physical radiation effects), Corrosive effects, Fuel cans, Lithium, Nuclear fuels, Swelling.

For abstract, see NSA 28 02, number 03042.

TIM-855(Suppl.11)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-542.
A. C. Loethen, and H. W. Jr. Ferry. 2 Jun 65, 3p

Descriptors: (*Uranium carbides, *Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Carbon additions, Physical radiation effects), Corrosive effects, Fuel cans, Lithium, Nuclear fuels, Tantalum, Tantalum carbides, Very high temperature.

For abstract, see NSA 28 02, number 03043.

TIM-855(Suppl.12)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-550.
A. C. Loethen, and H. W. Jr. Ferry. 2 Jun 65, 4p

Descriptors: (*Uranium carbides, *Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Carbon additions, Physical radiation effects), Corrosive effects, Fuel cans, Lithium, Nuclear fuels, Tantalum, Tungsten, Very high temperature.

For abstract, see NSA 28 02, number 03044.

TIM-855(Suppl.5)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-524.
C. E. Carlson, and F. F. Jr. Felber. 18 Jan 65, 11p

Descriptors: (*Niobium base alloys, *Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Tantalum, Physical radiation effects), (*Uranium carbides, Physical radiation effects), Fuel cans, Layers, Nuclear fuels.

For abstract, see NSA 28 02, number 03040.

TIM-855(Suppl.9)/GA PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
IRRADIATION AND EXAMINATION REPORT OF CAPSULE PW 26-512.
A. C. Loethen, and H. W. Ferry. 20 May 65, 3p

Descriptors: (*Uranium carbides, *Physical radiation effects), (*Niobium base alloys, Physical radiation effects), (*Zirconium alloys, Physical radiation effects), (*Fuel elements, Physical radiation effects), Fuel cans, Very high temperature.

For abstract, see NSA 28 02, number 03041.

TM-61-10-3/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
TESTING OF FUELED BEO AT HIGH PRESSURE IN FIVE DIFFERENT ENVIRONMENTS.
P. P. Turner. 26 Oct 61, 19p
Contract AT(40-1)-2847

Descriptors: (*Beryllium oxides, *Stability), (*Uranium dioxide, Stability), (*Yttrium oxides, Stability), (*Nuclear fuels, Stability), Air, Carbon dioxide, Helium, Medium pressure, Nitrogen, Testing, Very high temperature.

For abstract, see NSA 28 02, number 03045.

TM-62-11-7/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
GE-NMPO CLASSIFIED CONTRIBUTION TO 15TH HIGH TEMPERATURE FUELS COMMITTEE MEETING.
E. A. Aitken, and H. C. Brassfield. 1962, 29p
Contract AT(40-1)-2847

Descriptors: (*Uranium dioxide, *Phase diagrams), (*Uranium trioxide, Phase diagrams), (*Yttrium oxides, Phase diagrams), (*Beryllium oxides, *Stability), Chemical properties, Compacts, Fuel elements, Mechanical properties, Physical properties, Physical radiation effects, Tubes, Tungsten alloys, Very high temperature.

For abstract, see NSA 28 02, number 03047.

TM-62-5-1/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
COATED FUEL PARTICLES.
C. C. Browne, E. S. Funston, and R. E. Latta. May 62, 17p
Contract AT(40-1)-2847

Descriptors: (*Uranium dioxide, Coated fuel particles), (*Zirconium oxides, Coated fuel particles), (*Coated fuel particles, *Fabrication), Control, Particle size, Plasma arc spraying.

For abstract, see NSA 28 02, number 03158.

TM-62-6-6/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
SIZING AND APPLICATION OF BERYLLIA SYSTEMS WITH FUEL LOADINGS OF 10 TO 45 WEIGHT PERCENT URANIA.
J. M. Brunner, and R. N. Nassano. 1962, 37p
Contract AT(40-1)-2847

Descriptors: (*Ship propulsion reactors, *Reactor kinetics), Beryllium oxides, Buckling, Burnup, Ceramics, Group constants, Neutron reflectors, Nuclear fuels, Reactivity, Size, Solid fuels, Uranium dioxide, Yttrium oxides.

For abstract, see NSA 28 02, number 04574.

TM-63-6-16/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation. Oak Ridge National Lab., Tenn.
IRRADIATION OF A BEO BASE FUEL CONTAINING GD SUB 2 O SUB 3 AS A BURNABLE POISON.
J. D. Elkins. 28 May 63, 22p
Contract AT(40-1)-2847

Descriptors: (*Fuel elements, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Beryllium oxides, Physical radiation effects), Burnable poisons, Burnup, Gadolinium oxides, Very high temperature.

For abstract, see NSA 28 02, number 03051.

TM-63-6-2/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation. Oak Ridge National Lab., Tenn.
ZIRCONIUM HYDRIDE IRRADIATION LTZ/SUB X-2/.
J. D. Elkins. May 63, 15p
Contract AT(40-1)-2847

Descriptors: (*Zirconium hydrides, *Physical radiation effects), Hydride moderators, Litr reactor, Pile neutrons, Reactor cores, Very high temperature.

For abstract, see NSA 28 02, number 03048.

TM-63-6-7/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
COATED FUEL PARTICLE DEVELOPMENT AND EVALUATION.
R. E. Latta, and C. C. Browne. May 63, 21p
CONF-273-2

Descriptors: (*Uranium dioxide, Coated fuel particles), (*Yttrium oxides, Coated fuel particles), (*Zirconium oxides, Coated fuel particles), (*Coated fuel particles, *Fabrication), Compacts, Plasma arc spraying, Production, Spheres.

For abstract, see NSA 28 02, number 03049.

TM-63-6-8/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
INCORPORATION OF FUELED SPHERES IN A BERYLLIA MATRIX.
R. A. Joseph. May 63, 11p
Contract AT(40-1)-2847

Descriptors: (*Fuel particles, *Fabrication), (*Beryllium oxides, Fabrication), (*Uranium oxides, Fabrication), Extrusion, Mixing, Spheres.

For abstract, see NSA 28 02, number 03050.

TM-65-4-22/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation. Oak Ridge National Lab., Tenn.
REFRACTORY METAL FUEL ELEMENT IRRADIATION. TEST OPERATING REPORT LTFF-9.
R. E. Blevins. 29 Mar 65, 27p
Contract AT(40-1)-2847

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Thorium oxides, Physical radiation effects), (*Tungsten alloys, Physical radiation effects), (*Fuel elements, Physical radiation effects), Cermets, Fuel cans, Molybdenum alloys, Reactor cores, Rhenium alloys.

For abstract, see NSA 28 02, number 03052.

TM-66-3-18/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation. Oak Ridge National Lab., Tenn.
REFRACTORY METAL FUEL ELEMENT IRRADIATION. TEST OPERATING REPORT LTFF-11.
R. E. Blevins. 2 Mar 66, 27p
Contract AT(40-1)-2847

Descriptors: (*Fuel elements, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Thorium oxides, Physical radiation effects), (*Tungsten alloys, Physical radiation effects), Fission products, Litr reactor, Molybdenum alloys, Rhenium alloys, Stability, Very high temperature.

For abstract, see NSA 28 02, number 03053.

TM-67-3-6/GA PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation. Oak Ridge National Lab., Tenn.
TEST OPERATING REPORT LTFRY-1.
R. E. Blevins. 16 Feb 67, 21p
Contract AT(40-1)-2847

Descriptors: (*Fuel elements, *Physical radiation effects), Fission, Fuel cans, Molybdenum alloys, Rhenium alloys, Very high temperature.

For abstract, see NSA 28 02, number 03054.

WAPD-TM-1027/GA PC$4.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA.
IRRADIATION CREEP BASED ON DISLOCATION CLIMB (LWBR DEVELOPMENT PROGRAM).
C. C. Dollins. Feb 73, 44p
Contract AT(11-1)-Gen-14

Descriptors: (*Creep, *Physical radiation effects), (*Reactor materials, Physical radiation effects), Alloys, Dislocations, Dispersion hardening, Metals, Neutron beams, Neutron fluence, Neutron flux, Temperature dependence.

For abstract, see NSA 28 02, number 03294.

WAPD-TM-1066/GA PC$3.00/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA.
VISCOELASTIC ANALYSIS OF IN-PILE STRESS RELAXATION (LWBR DEVELOPMENT PROGRAM).
R. A. Wolfe, and B. Z. Hyatt. Mar 73, 16p
Contract AT(11-1)-Gen-14

Descriptors: (*Stainless steels, *Physical radiation effects), Breeder reactors, Creep, Elasticity, Maxwell equations, Mockup, Stress relaxation.

For abstract, see NSA 28 02, number 03295.

WASH-1196(73)/GA PC$4.00/MF$1.45
Division of Production and Materials Management (Aec), Washington, D.C.
SURVEY OF UNITED STATES URANIUM MARKETING ACTIVITY.
Apr 73, 20p

Descriptors: (*Uranium, *Availability), Fuel cycle, Market, Mining, Nuclear power plants, Reactors, Usa.

For abstract, see NSA 28 03, number 07508.

WCAP-3385-34/GA PC$4.25/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Nuclear Fuel Div.
SAXTON PLUTONIUM PROJECT QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING DECEMBER 31, 1972.
R. C. Goodspeed. Mar 73, 43p
Contract AT(11-1)-3044

Descriptors: (*Saxton reactor, *Fuel elements), (*Plutonium, *Fuel cycle), (*Pwr type reactors, Fuel cycle), Irradiation, Performance testing, Physical radiation effects.

For abstract, see NSA 28 02, number 04497.

Y-DR-107/GA PC$3.25/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
CALCULATED CRITICALITY OF WATER MODERATED OXIDES OF URANIUM-233, THORIUM-232, AND CARBON MIXTURES.
J. T. Thomas. 30 Apr 73, 24p
Contract W-7405-eng-26

Descriptors: (*Uranium dioxide, *Criticality), (*Thorium oxides, Criticality), Carbon, K codes, Mixtures, Safety, Thorium 232, Uranium 233, Water moderator.

For abstract, see NSA 28 02, number 03457.

Y-1857/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
PRECURSOR CARBON AND MOLDED GRAPHITE STUDIES. NERVA FUEL ELEMENT DEVELOPMENT PROGRAM SUMMARY REPORT, JULY 1966–JUNE 1972.
L. G. Overholser. 6 Apr 73, 92p
Contract W-7405-eng-26

Descriptors: (*Condensed aromatics, *Carbonization), (*Graphite, *Fabrication), (*Carbon, Fillers), (*Fillers, *Chemical preparation), Anisotropy, Argon, Density, Dilution, Elasticity, Electric conductivity, Flexural strength, High temperature, Mechanical properties, Microstructure, Nitrogen, Physical properties, Porosity, Pressing, Pyrolysis, Ruptures, Strains, Tar, Thermal expansion, Thermal shock, Very high pressure, Very high temperature.

For abstract, see NSA 28 03, number 06386.

18K. Reactor Physics

AAEC/E-254/GA PC$3.25/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
TIME DEPENDENT EXP 237 NP, EXP 235 U, AND EXP 239 PU FISSION RATES IN A THORIUM ASSEMBLY DURING THE INTERVAL 0 TO 200 NS USING A PULSED EXP 9 BE(D,N) SOURCE. PART 1. EXPERIMENT.
S. P. Moo, M. T. Rainbow, and A. I. M. Ritchie. Mar 73, 23p
U.S. Sales Only.

Descriptors: (*Subcritical assemblies, *Pulsed neutron techniques), (*Neptunium 237, *Fission), (*Plutonium 239, Fission), (*Uranium 235, Fission), Boundary conditions, Decay, Errors, Fast neutrons, Fourier analysis, Mev range 01-10, Neutron beams, Neutron detection, Neutron leakage, Neutron sources, Nuclear reaction kinetics, Pulses, Spatial distribution, Thorium, Three-dimensional calculations, Time dependence, Time-of-flight method.

For abstract, see NSA 28 03, number 07433.

AAEC/TM-630/GA PC$3.50/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
EXAMINATION OF DESIGN METHODS FOR CALCULATING POWER DISTRIBUTIONS IN BATCH FUELLED REACTORS.
E. W. Hesse. Aug 72, 28p
U.S. Sales Only.

Descriptors: (*Sghwr reactor, *Power density), Accuracy, Burnup, Computer calculations, Cross sections, Form factors, Fuel channels, Fuel pins, Irradiation, Multigroup theory, Neutron flux, Peaks, Reactor cells, Reactor cores, Reactor simulators, Simulation.

For abstract, see NSA 28 03, number 07306.

AAEW-M-1172/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
USE OF MURAL FOR CALCULATION OF NEUTRON AGE AND HIGHER MOMENTS OF THE NEUTRON DISTRIBUTION.
J. H. Spanton. Mar 73, 17p
U.S. Sales Only.

Descriptors: (*Neutron flux, *Spatial distribution), (*Graphite moderator, Neutron flux), (*Water moderator, Neutron flux), Computer calculations, M codes, Neutron spectra.

For abstract, see NSA 28 03, number 07434.

AI-AEC-13076(Vol.2)/GA PC$3.00/MF$1.45
Atomics International, Canoga Park, Calif.
SELECTED COMPUTER CODES AND LIBRARIES. VOLUME II. APC: A MULTIGROUP TRANSPORT BUCKLING ITERATION CODE.
D. S. Bost. 2 May 73, 144p
Contract AT(04-3)-701

Descriptors: (*Neutron transport theory, *A codes), (*Computer codes, A codes), (*Reactor kinetics, *Buckling), Iterative methods, Neutron leakage.

For abstract, see NSA 28 02, number 04615.

AREAER-153/GA PC$4.00/MF$1.45
Atomic Energy Establishment, Cairo (Egypt). Reactor and Neutron Physics Dept.
NUMERICAL FORMULATION OF MULTIGROUP AND DISCRETE S/SUB N/ METHODS FOR REACTOR ANALYSIS.
S. F. Nassar. 1972, 38p
U.S. Sales Only.

Descriptors: Carlson method, Cylindrical configuration, Discrete ordinate method, Multigroup theory, Numerical solution, One-dimensional calculations, Reactor kinetics, Slabs, Spherical configuration, Two-dimensional calculations.

For abstract, see NSA 28 02, number 04616.

AREAEE-158/GA PC$4.00/MF$1.45
Atomic Energy Establishment, Cairo (Egypt). Reactor and Neutron Physics Dept.
LEGENDRE MOMENTS OF NELKIN'S KERNEL FOR WATER-DESCRIPTION OF KERNEN-CODE.
S. F. Nassar, and E. Abul-Ela. 1972, 40p
U.S. Sales Only.

Descriptors: (*Water moderated reactors, *Neutron spectra), (*Slow neutrons, *Scattering), (*Water moderator, Slow neutrons), (*Computer codes, *K codes), Energy spectra, Fortran, Icl computers, Legendre polynomials, Nelkin theory.

For abstract, see NSA 28 02, number 04617.

CEA-CONF-2162/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
MEASUREMENT OF REACTOR NEUTRON FLUX WITH HIGH-TEMPERATURE FISSION CHAMBERS AND COBALT COLLECTORS.
E. Bacconnet, G. Dauphin, J. Duchene, and R. Verdant. 1972, 20p CONF-730108-1
In French. U.S. Sales Only.

Descriptors: (*Self-powered detectors, *Performance), (*Fission chambers, Performance), (*Neutron flux, Fission chambers), Cobalt, High temperature, In core instruments.

For abstract, see NSA 28 03, number 05607.

CEA-CONF-2163/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
MINICALCULATOR FOR NEUTRON MEASUREMENTS IN A NUCLEAR REACTOR.
P. Jover. 1973, 14p CONF-730108-4
In French. U.S. Sales Only.

Descriptors: (*Reactor control systems, *Computers), France, Neutron flux, Power, Reactivity, Reactor period.

For abstract, see NSA 28 03, number 07512.

COO-2250-1/GA PC$7.60/MF$1.45
Massachusetts Inst. Of Tech., Cambridge. Dept. Of Nuclear Engineering.
HETEROGENEOUS EFFECTS IN FAST BREEDER REACTORS.
M. V. Gregory, M. J. Driscoll, and D. D. Lanning. Jan 73, 266p MITNE-142
Contract AT(11-1)-2250

Descriptors: (*Fbr type reactors, *Reactor kinetics), (*Sodium cooled reactors, Reactor kinetics), Analytical solution, Breeding ratio, Cross sections, Heterogeneous effects, Neutron flux, Perturbation theory, Reactivity worths, Self-shielding.

For abstract, see NSA 28 03, number 07327.

EURFNR-1082/GA PC$4.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Neutronenphysik und Reaktortechnik.
FINE GROUP CALCULATIONS FOR REACTIVITY COEFFICIENTS OF STRUCTURAL MATERIALS IN FAST REACTORS.
E. Kiefhaber. Feb 73, 43p KFK-1759
U.S. Sales Only.

Descriptors: (*Fast reactors, Reactor materials), (*Reactor materials, *Reactivity coefficients), Cross sections, Fine structure, Group constants, Perturbation theory, Scattering, Zero power reactors.

For abstract, see NSA 28 03, number 07438.

EURFNR-1083/GA PC$5.45/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Neutronenphysik und Reaktortechnik.
KINTIC-1: A PROGRAM FOR THE CALCULATION OF TWO-DIMENSIONAL REACTOR DYNAMICS OF FAST REACTORS WITH THE QUASISTATIC METHOD.
L. Mayer, and H. Bachmann. Nov 72, 114p KFK-1627
U.S. Sales Only.

Descriptors: (*K codes, *Excursions), (*Computer codes, K codes), (*Sodium cooled reactors, Excursions), (*Fbr type reactors, Excursions), Reactor accidents, Reactor core disruption, Reactor kinetics.

For abstract, see NSA 28 03, number 07423.

FEI-298/GA PC$3.00/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
INDICES OF THE EFFECTIVENESS OF REACTOR MATERIALS AND FACTORS OF NEUTRON LEAKAGE.
V. E. Levin, and V. Ya. Pupko. 1972, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Homogeneous reactors, *Neutron leakage), Analytical solution, Neutron reflectors, Reactor materials, Spherical configuration.

For abstract, see NSA 28 03, number 07439.

FEI-361/GA PC$4.75/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
ANALYSIS OF INTEGRAL DATA WITH THE PURPOSE OF PREDICTING REACTOR PERFORMANCE.
A. A. Van'kov. 1972, 51p
In Russian. U.S. Sales Only.

Descriptors: (*Fast reactors, *Reactor kinetics), Data, Performance.

For abstract, see NSA 28 03, number 07440.

JAERI-M-4874/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
COMPUTER CODES ST-1 AND ST-2 FOR CALCULATION OF NEUTRON ENERGY SPECTRUM IN A FUEL-ROD CELL.
M. Toba, and Y. Naito. Jul 72, 48p
In Japanese. U.S. Sales Only.

Descriptors: (*Reactor cells, *Neutron spectra), (*Computer codes, *S codes), (*Bwr type reactors, Reactor cells), Energy range, Energy spectra, Fast neutrons, Fuel rods, Multigroup theory, Neutron slowing-down theory, Numerical solution, Plutonium oxides, Plutonium 240, Resonance absorption, T codes, U codes, Uranium dioxide.

For abstract, see NSA 28 02, number 04487.

JAPFNR-97/GA PC$4.00/MF$1.45
Mitsubishi Atomic Power Industries, Inc., Omiya (Japan).
2D-GAMMA: TWO-DIMENSIONAL GAMMA HEATING CODE FOR FAST REACTORS.
Mar 72, 47p J-206-72-02
U.S. Sales Only.

Descriptors: (*Gamma radiation, *Heating), (*Computer codes, *Number codes), (*Monju reactor, *Power), (*Fbr type reactors, Power), Carlson method, Distribution, Neutron flux, Two-dimensional calculations.

For abstract, see NSA 28 02, number 04542.

N-72-31663/GA PC$5.45/MF$1.45
Atomics International, Canoga Park, Calif.
EXPERIMENTAL PHYSICS CHARACTERISTICS OF A HEAVY-METAL-REFLECTED FAST-SPECTRUM CRITICAL ASSEMBLY. SUMMARY REPORT.
W. H. Heneveld, R. K. Paschall, T. H. Springer, V. A. Swanson, and A. W. Thiele. 28 Jan 72, 138p
NASA-CR-120959, AI-72-33
Contract NAS3-14421

Descriptors: (*Zero power reactors, *Reactor kinetics), (*Snap reactors, *Mockup), Fast reactors, Liquid metal cooled reactors, Lithium, Molybdenum, Performance, Polyethylenes, Reactivity worths, Tantalum, Tungsten, Uranium nitrides.

For abstract, see NSA 28 02, number 04567.

N73-27581/0GA PC$6.00/MF$1.45
Science, Technology and Research, Inc., Atlanta, Ga.
DYNAMIC ANALYSIS OF GAS-CORE REACTOR SYSTEM.
Final Report.
K. H. Turner, Jr.. Mar 73, 79p NASA-CR-121253
Contract NAS3-16735

Descriptors: *Dynamic models, *Gaseous fission reactors, Dynamic response, Heat transfer, Perturbation, Reactivity, Reactor cores.

For abstract, see STAR 1118

ORNL-TM-4179/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
IMPROVED REPRESENTATION OF SOME ASPECTS OF CIRCULATING-FUEL REACTOR KINETICS.
B. E. Prince. May 73, 38p
Contract W-7405-eng-26

Descriptors: (*Molten salt fueled reactors, *Reactor kinetics), (*Fluid fueled reactors, Reactor kinetics), Delayed neutron precursors, Differential equations, Kernels, Neutron density, Temperature dependence, Time dependence, Transients, Weighting functions.

For abstract, see NSA 28 03, number 07443.

ORO-3443-43/GA PC$3.50/MF$1.45
Maryland Univ., College Park. Inst. For Fluid Dynamics and Applied Mathematics.
MATHEMATICAL AND COMPUTATIONAL PROBLEMS IN REACTOR CALCULATIONS.
I. Babuska, and R. B. Kellogg. Mar 73, 29p BN-760
Contract AT(40-1)-3443

Descriptors: Design, Finite element method, Mathematics, Neutron diffusion equation, Neutron transport theory, Reactor cells, Reactor kinetics equations, Reactor lattice parameters.

For abstract, see NSA 28 03, number 07444.

RD/B/N-2389/GA PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
PINMOC: A MONTE CARLO CODE FOR ESTIMATING FIRST-FLIGHT PROBABILITIES IN A TWO-DIMENSIONAL PIN CLUSTER.
R. C. Bending, and G. E. Parkes. Jan 73, 20p
U.S. Sales Only.

Descriptors: (*Computer codes, P codes), (*Fuel element clusters, *Neutron transport theory), (*P codes, *Monte carlo method), Collisions, Hexagonal configuration, Neutrons, Probability, Programming, Reactor cells, Reactor lattices, Rectangular configuration.

For abstract, see NSA 28 03, number 07445.

RISO-M-1568/GA PC$3.75/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
CRS: A CODE TO PRODUCE MULTIGROUP NEUTRON CROSS SECTIONS FOR REACTOR PHYSICS CALCULATIONS.
A. M. Hvidtfeldt Larsen. Jan 73, 35p
U.S. Sales Only.

Descriptors: (*C codes, *Reactor kinetics), (*Computer codes, C codes), (*Water moderated reactors, Reactor kinetics), Algol, Burroughs computers, Cross sections, Fine structure, Multigroup theory, Neutron reactions.

For abstract, see NSA 28 03, number 07446.

RT/FI-(72)44/GA PC$6.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy). Divisione Affari Internazionali E Studi Economici.
BRINGING UP TO DATE, USING, AND CONTROLLING THE MULTIGROUP CROSS SECTION LIBRARY FOR FAST REACTOR CALCULATIONS.
M. Cosimi, and M. Salvatores. 26 Sep 72, 79p
In Italian. U.S. Sales Only.

Descriptors: (*Fast reactors, *Reactor kinetics), (*Neutron reactions, *Cross sections), Data.

For abstract, see NSA 28 02, number 04619.

RT/PROT-(72)41/GA PC$5.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
SOTRAN: UNIVAC 1108 PROGRAM FOR CALCULATION OF POWER TRANSIENTS IN A PULSED NUCLEAR REACTOR.
F. Palma, and D. Sardone. 21 Dec 72, 71p
In Italian. U.S. Sales Only.

Descriptors: (*Computer codes, *S codes), (*Pulsed reactors, *Transients), Neutron sources, Power, Reactor cores, Reactor kinetics, Reactor operation, Univac computers.

For abstract, see NSA 28 02, number 04620.

SLA-73-5156/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
MODERATOR EFFECTS WITH THE SANDIA PULSED REACTOR II.
J. A. Reuscher, and T. R. Schmidt. 1973, 14p
CONF-730212-3

Descriptors: (*Spr-2 reactor, *Moderators), Boron 10, Cadmium, Fission, Polyethylenes, Reactivity worths, Reactor cores.

For abstract, see NSA 28 03, number 07366.

18L. Reactors (Power)

AECL-4356/GA PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario).
PRESENT STATUS AND FUTURE DEVELOPMENT OF HEAVY-WATER REACTORS IN CANADA.
J. L. Gray, and I. N. MacKay. Jan 73, 11p CONF-721222-1
U.S. Sales Only.

Descriptors: (*Canada, *Nuclear power plants), Availability, Cost, Fossil fuels, Gentilly reactor, Heavy water, Heavy water cooled reactors, Heavy water moderated reactors, Hydroelectric power plants, Organic cooled reactors, Pickering-1 reactor, Pickering-2 reactor, Pickering-3 reactor, Planning, Power plants, Reviews.

For abstract, see NSA 28 03, number 07307.

CEA-CONF-2099/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
PHENIX: PROTOTYPE FAST-REACTOR POWER PLANT.
J. Megy, B. Guillemard, E. Robert, J. P. Crette, and P. Labat. 1972, 22p CONF-721062-2
In French. U.S. Sales Only.

Descriptors: (*Phenix reactor, *Design), Fabrication, Planning, Reactor components, Reactor vessels, Sodium, Testing.

For abstract, see NSA 28 02, number 04532.

GULF-GA-A-12515/GA PC$7.50/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
HTGR BASE PROGRAM QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1973.
30 Mar 73, 108p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, *Research programs), (*Graphite, *Oxidation), Coated fuel particles, Combustion, Crushing, Fuel cycle, Head end processes, Leaching, Reprocessing, Separation processes, Physical radiation effects, Tensile properties, Helium, Steam, Irradiation, Thorium oxides, Uranium dioxide, Performance testing, Thermocouples.

For abstract, see NSA 28 03, number 07295.

JAPFNR-94/GA PC$4.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
FAST BREEDER REACTOR DEVELOPMENT AT PNC, JAPAN. QUARTERLY PROGRESS REPORT, SEPTEMBER--NOVEMBER 1972.
Mar 73, 10p
U.S. Sales Only.

Descriptors: (*Joyo reactor, *Planning), (*Monju reactor, Planning), Design, Fabrication, Reactor components, Testing.

For abstract, see NSA 28 02, number 04541.

18M. Reactors (Non-Power)

CEA-CONF-2152/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.
NEUTRONICS OF MEDIUM-POWER REACTORS.
C. Desandre. 1972, 22p CONF-721138-5
In French. U.S. Sales Only.

Descriptors: (*Research reactors, Reactor experimental facilities), (*Reactor experimental facilities, *Design), In pile loops, Neutron beams, Neutron spectroscopy, Planning, Triton reactor.

For abstract, see NSA 28 03, number 07358.

CONF-721138-1/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
SOURCES OF COLD NEUTRONS.
P. Ageron, J. M. Astruc, D. Cribier, G. Der Nigohossian, and J. P. Perves. Sep 72, 16p SM-165-27
In French. U.S. Sales Only.

Descriptors: (*Research reactors, *Cold neutrons), Configuration, El-3 reactor, Grenoble reactor, Performance, Reactor experimental facilities.

For abstract, see NSA 28 03, number 07359.

LA-5189-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NUCLEAR FURNACE-1 TEST REPORT.
W. L. Kirk. Mar 73, 112p
Contract W-7405-eng-36

Descriptors: (*Nuclear furnace reactor, *Performance testing), Design, Fuel elements, Gaseous wastes, Performance, Radioactive wastes, Reactor cores, Reactor dismantling, Space propulsion reactors.

For abstract, see NSA 28 02, number 04566.

18N. Snap Technology

AD-767 584/6GA PC$3.00/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
LINCOLN EXPERIMENTAL SATELLITES 8 AND 9 HOT DROP TESTS.
Technical rept. 21 Apr-7 Jul 72,
David L. Tate, and Gilbert L. Zigler. Oct 73, 40p
Rept no. AFWL-TR-73-171

Descriptors: (*Radioactive batteries, *Drop testing), (*Communication satellites(Active), Auxiliary power plants), Radioactive isotopes, Electric power production, Safety, Plutonium.
Identifiers: *Radioisotope thermoelectric devices, C-130A aircraft, LES-8 satellite, LES-9 satellite, Plutonium 238, Nuclear auxiliary power units.

An adequate nuclear safety evaluation is conducted for any USAF launched mission which uses nuclear powered electrical generators. The Lincoln Experimental Satellites 8 and 9 (LES 8/9) are such a mission. The total inventory of plutonium-238 is in excess of 280,000 curies. Terminal velocity and impact orientation of the radioisotope thermoelectric generators (RTG) are required. Actual drop tests of simulated models were deemed the most appropriate and expeditious method for obtaining the necessary basic data. Two electric furnaces mounted on the cargo ramp of a C-130A aircraft were used in the conduct of the tests. Simulated components of the RTGs were dropped on White Sands Missile Range (WSMR), some at ambient temperature and the remainder at about 1500F. Optical and radar tracking along with motion picture coverage provided the necessary information on velocity and orientation. The hot body effect was observed, i.e., identical objects fell some 18 percent slower when dropped after being heated to about 1500F as opposed to those dropped at ambient temperature. The tests were completed ahead of schedule and exceeded all objectives. (Author)

AI-AEC-13058/GA PC$3.00/MF$1.45
Atomics International, Canoga Park, Calif.
PERFORMANCE MODELING OF THE 5-KWE REACTOR THERMOELECTRIC SYSTEM.
R. V. Anderson. 3 Apr 73, 76p
Contract AT(04-3)-701

Descriptors: (*Computer codes, *S codes), (*Thermoelectric generators, *Performance), (*Snap reactors, Thermoelectric generators), Honeywell computers, Liquid metals, Pipes, Pumps, Radiators, Simulation, Temperature dependence.

For abstract, see NSA 28 03, number 07372.

GULF-GA-A-12251/GA PC$3.00/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
DEVELOPMENT OF A THERMIONIC REACTOR SPACE POWER SYSTEM. SUMMARY REPORT FOR PERIOD MARCH 1--JUNE 30, 1972.
5 Jan 73, 302p
Contract AT(04-3)-840

Descriptors: (*Thermionic reactors, Fuel elements), (*Snap reactors, *Research programs), (*Fuel elements, *Thermionic converters), Design, Fuel cans, Irradiation, Performance testing, Reactor kinetics, Reactor safety, Space power reactors, Space propulsion reactors, Uranium carbides, Uranium dioxide.

For abstract, see NSA 28 03, number 07379.

GULF-GA-A-12419/GA PC$5.45/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
UNDERSEA THERMIONIC REACTORS.
D. T. Allen, H. C. Carney, C. R. Fisher, D. J. Heisser, and W. G. Homeyer. 13 Feb 73, 124p
Contract AT(04-3)-840

Descriptors: (*Thermionic reactors, *Design), (*Power reactors, *Seas), Fuel elements, Reactor operation, Snap reactors, Thermionic converters, Triga type reactors.

For abstract, see NSA 28 03, number 07380.

GULF-GA-C-12308/GA PC$5.00/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
THERMIONIC REACTOR POWER SYSTEM DEVELOPMENT. VOLUME IV. REACTOR PLAN.
13 Mar 73, 57p
Contract AT(04-3)-840

Descriptors: (*Thermionic reactors, *Design), (*Space flight, Thermionic reactors), Cesium, Fuel elements, Liquid metals, Planning, Snap reactors, Thermionic converters.

For abstract, see NSA 28 03, number 07381.

NAA-SR-11097/GA PC$3.75/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP AEROSPACE SAFETY PROGRAM. PROGRESS REPORT, JANUARY--MARCH 1965.
R. L. Detterman. 15 May 65, 33p
Contract AT(11-1)-Gen-8

Descriptors: (*Snap reactors, *Reactor safety), (*Snaptran reactors, *Performance), Pipes, Pumps, Reentry, Space flight, Testing, Underwater.

For abstract, see NSA 28 03, number 07394.

NAA-SR-11361/GA PC$4.50/MF$1.45
Atomics International, Canoga Park, Calif.
WATER IMMERSION SAFETY FOR SNAP REACTORS.
J. P. Hawley. 30 Sep 67, 49p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Reactor safety), Criticality, Gadolinium, Moderators, Neutrons, Reactivity worths, Reactor accidents, Reactor cores, Shielding, S10 reactor, S8 reactor, Underwater.

For abstract, see NSA 28 03, number 07395.

NAA-SR-11492/GA PC$10.00/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 8 PROGRESS REPORT, MAY--JULY 1965.
D. G. Mason. 30 Sep 65, 156p
Contract AT(11-1)-Gen-8

Descriptors: (*S8er reactor, *Fuel elements), (*S8dr reactor, *Design), Reactor cores, Research programs, Snap reactors, Testing.

For abstract, see NSA 28 03, number 07396.

NAA-SR-11497/GA PC$4.00/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP AEROSPACE SAFETY PROGRAM. PROGRESS REPORT, APRIL--JUNE 1965.
R. L. Detterman. 15 Aug 65, 39p
Contract AT(11-1)-Gen-8

Descriptors: (*Snap reactors, *Reactor safety), (*Snaptran reactors, *Testing), Ablation, Burnup, Performance, Reentry, S10fs-4 reactor.

For abstract, see NSA 28 03, number 07397.

NAA-SR-11597/GA PC$6.00/MF$1.45
Atomics International, Canoga Park, Calif.
MERCURY RANKINE PROGRAM ALTERNATOR BORE SEAL--UNSEALED ALTERNATOR.
H. Horii, and A. I. Wesolowski. 15 Mar 66, 78p
Contract AT(11-1)-Gen-8

Descriptors: (*Alternators, *Seals), (*S2 reactor, Alternators), Leaks, Mercury, Rankine cycle, Snap reactors, Stators.

For abstract, see NSA 28 03, number 07398.

NAA-SR-11690/GA PC$4.50/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP REACTOR IMPROVEMENT PROGRAM. PROGRESS REPORT, JULY--SEPTEMBER 1965.
L. M. Maki. 22 Nov 65, 46p
Contract AT(11-1)-Gen-8

Descriptors: (*S10 reactor, *Research programs), (*S2 reactor, Research programs), (*S8 reactor, Research programs), Performance, Reactor operation, Snap reactors.

For abstract, see NSA 28 03, number 07399.

NAA-SR-11692/GA PC$5.75/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 8 PROGRESS REPORT, AUGUST--OCTOBER 1965.
D. G. Mason. 29 Dec 65, 73p
Contract AT(11-1)-Gen-8

Descriptors: (*S8er reactor, *Design), Fuel elements, Performance, Planning, Reactor components, Reactor cores, Reactor dismantling, Snap reactors, Testing.

For abstract, see NSA 28 03, number 07400.

NAA-SR-11696/GA PC$3.75/MF$1.45
Atomics International, Canoga Park, Calif.
PROGRESS REPORT FOR SNAP (SYSTEMS FOR NUCLEAR AUXILIARY POWER) GENERAL SUPPORTING TECHNOLOGY, AUGUST--OCTOBER 1965.
L. S. Mims. 15 Jan 66, 34p
Contract AT(11-1)-GEN-8

Descriptors: (*Snap reactors, *Research programs), Design, Reactor kinetics, Reactor stability, Simulation.

For abstract, see NSA 28 03, number 07401.

NAA-SR-11697/GA PC$4.25/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP AEROSPACE SAFETY PROGRAM. PROGRESS REPORT, JULY--SEPTEMBER 1965.
R. L. Detterman. 15 Nov 65, 42p
Contract AT(11-1)-Gen-8

Descriptors: (*Snap reactors, *Reactor safety), (*Snaptran reactors, *Testing), Ablation, Burnup, Reentry, Space vehicles.

For abstract, see NSA 28 03, number 07402.

NAA-SR-11756/GA PC$5.25/MF$1.45
Atomics International, Canoga Park, Calif.
PROGRESS REPORT FOR SNAP GENERAL SUPPORTING TECHNOLOGY, NOVEMBER 1965--JANUARY 1966.
L. S. Mims. 15 Mar 66, 62p
Contract AT(11-1)-GEN-8

Descriptors: (*Snap reactors, *Research programs), Cross sections, Data, Heat transfer, Mass transfer, Neutron reactions, Reactor kinetics, Shielding, Shielding materials.

For abstract, see NSA 28 03, number 07403.

NAA-SR-11757/GA PC$6.75/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 10A PROGRESS REPORT, OCTOBER--DECEMBER 1965.
D. W. Staub. 10 Mar 66, 92p
Contract AT(11-1)-Gen-8

Descriptors: (*S10fs-4 reactor, *Performance), (*S10fs-3 reactor, *Reactor operation), Failures, Reactor safety, Reactor shutdown, Snap reactors, Space flight, Testing, Voltage regulators.

For abstract, see NSA 28 03, number 07404.

NAA-SR-11882/GA PC$7.75/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP REACTOR IMPROVEMENT PROGRAM. PROGRESS REPORT, JANUARY--MARCH 1966.
L. M. Maki. 23 May 66, 113p
Contract AT(11-1)-Gen-8

Descriptors: (*S2 reactor, *Research programs), (*S8 reactor, Research programs), (*S10 reactor, Research programs), Design, Fuel cans, Performance, Reactor components, Ruptures, Snap reactors, Swelling, S8dr reactor, S8er reactor.

For abstract, see NSA 28 03, number 07405.

NAA-SR-11950/GA PC$4.00/MF$1.45
Atomics International, Canoga Park, Calif.
EXPERIMENTAL INVESTIGATIONS FOR DESIGN OF SUBCRITICAL WATER-IMMERSED SNAP REACTORS.
W. H. Heneveld. 28 Jul 66, 37p
Contract AT(11-1)-Gen-8

Descriptors: (*Snap reactors, *Reactivity), (*S10 reactor, *Mockup), Gadolinium, Reactor safety, Subcritical assemblies, Testing, Underwater, Zero power reactors.

For abstract, see NSA 28 03, number 07406.

NAA-SR-12021/GA PC$5.50/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP AEROSPACE NUCLEAR SAFETY PROGRAM. PROGRESS REPORT, APRIL--JUNE 1966.
R. L. Detterman. 15 Aug 66, 67p
Contract AT(11-1)-Gen-8

Descriptors: (*Snap reactors, *Reactor safety), (*Snaptran reactors, *Testing), Computer codes, Fuel elements, Reactor kinetics, Reactor shutdown, Reentry, Snap 10 reactor, Space flight.

For abstract, see NSA 28 03, number 07407.

NAA-SR-12300/GA PC$5.25/MF$1.45
Atomics International, Canoga Park, Calif.
FUNCTIONAL DESIGN DESCRIPTION AND TEST SUMMARY OF THE SNAP 8 DEVELOPMENT REACTOR MOCKUP-1.
W. J. Kurzeka. 24 Feb 67, 64p
Contract AT(04-3)-701

Descriptors: (*S8dr reactor, *Mockup), Design, Performance testing.

For abstract, see NSA 28 03, number 07408.

NAA-SR-12454/GA PC$3.75/MF$1.45
Atomics International, Canoga Park, Calif.
GENERAL SUPPORTING TECHNOLOGY PROGRESS REPORT FOR SNAP, FEBRUARY--APRIL 1967.
L. S. Mims. 20 Jun 67, 32p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Research programs), Efficiency, Fabrication, Pumps, Reactor kinetics, Shielding, Shielding materials, S10fs-3 reactor, Testing.

For abstract, see NSA 28 03, number 07409.

NAA-SR-12482/GA PC$5.75/MF$1.45
Atomics International, Canoga Park, Calif.
S8DR CORE PERFORMANCE EVALUATION.
L. D. Swenson. 9 Aug 67, 74p
Contract AT(04-3)-701

Descriptors: (*S8dr reactor, *Reactor cores), Design, Fuel elements, Hydrogen, Leaks, Performance, Reactor operation, Snap reactors, S8er reactor.

For abstract, see NSA 28 03, number 07410.

NAA-SR-12564/GA PC$7.00/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 8 DEVELOPMENTAL REACTOR (S8DR) CORE THERMAL AND HYDRAULIC PERFORMANCE.
P. M. Magee. 10 Mar 68, 96p
Contract AT(04-3)-701

Descriptors: (*S8dr reactor, *Reactor cores), Cooling, Heat transfer, Hydraulics, Performance, Snap reactors.

For abstract, see NSA 28 03, number 07411.

NAA-SR-6395/GA PC$3.25/MF$1.45
Atomics International, Canoga Park, Calif.
PROGRESS REPORT FOR SNAP SUPPORTING R AND D, DECEMBER 1960--MARCH 1961.
M. V. Davis. 15 Jun 61, 22p
Contract AT(11-1)-GEN-8

Descriptors: (*S2 reactor, *Research programs), (*S8 reactor, Research programs), (*S10 reactor, Research programs), Design, Efficiency, Radiators, Reactor safety, Reentry, Shielding, Snap reactors, Thermal radiation, Thermionic converters.

For abstract, see NSA 28 03, number 07386.

NAA-SR-7492/GA PC$8.25/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 8 QUARTERLY PROGRESS REPORT, APRIL--JUNE 1962.
1 Mar 63, 123p
Contract AT(11-1)-GEN-8

Descriptors: (*S8 reactor, *Research programs), Design, Mechanical vibrations, Reactor components, Reactor cores, Shielding, Snap reactors, S8dr reactor, S8er reactor.

For abstract, see NSA 28 03, number 07387.

NAA-SR-7494/GA PC$5.75/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 2/10A REACTOR QUARTERLY PROGRESS REPORT, APRIL--JUNE 1962.
5 Feb 63, 74p
Contract AT(11-1)-GEN-8

Descriptors: (*S2ds reactor, *Design), (*S10fs-1 reactor, Design), Fuel elements, Reactor components, Reactor materials.

For abstract, see NSA 28 03, number 07388.

NAA-SR-7792(Vol.1)/GA PC$13.00/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 8 QUARTERLY PROGRESS REPORT, JULY--SEPTEMBER 1962. VOL. I. REACTOR ENGINEERING AND SYSTEM TESTS.
C. J. Johnson. 22 Apr 63, 216p
Contract AT(11-1)-GEN-8

Descriptors: (*S8er reactor, *Design), Fuel elements, Performance testing, Reactor components.

For abstract, see NSA 28 03, number 07389.

NAA-SR-9400(Vol.3)/GA PC$7.75/MF$1.45
Atomics International, Canoga Park, Calif.
LITHIUM HYDRIDE TECHNOLOGY. III. PROPERTIES OF LITHIUM HYDRIDE FOR SNAP SHIELDING APPLICATIONS.
F. H. Welch. 1 May 67, 114p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Shielding materials), (*Lithium hydrides, *Mechanical properties), Chemical properties, Corrosion, Physical properties, Physical radiation effects.

For abstract, see NSA 28 03, number 07390.

NAA-SR-9903/GA PC$4.50/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 10A REACTOR THERMAL PERFORMANCE.
P. M. Magee, G. E. Dufoe, and J. D. Gordon. 1 Sep 64, 48p
Contract AT(11-1)-Gen-8

Descriptors: (*S10 reactor, *Performance), Fuel elements, Reactor operation, Reactor start-up, Snap reactors, Thermal stresses, Transients.

For abstract, see NSA 28 03, number 07391.

NAA-SR-9990/GA PC$8.00/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP REACTOR IMPROVEMENT PROGRAM. PROGRESS REPORT, APRIL--JUNE 1964.
R. J. Gimera, and J. Susnir. 31 Aug 64, 118p
Contract AT(11-1)-Gen-8

Descriptors: (*S2 reactor, *Research programs), (*S10 reactor, Research programs), Design, Fuel elements, Shielding, Snap reactors, Testing.

For abstract, see NSA 28 03, number 07392.

N73-27586/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER OPTIMIZATION OF REACTOR-THERMOELECTRIC SPACE POWER SYSTEMS.
W. L. Maag, P. M. Finnegan, and L. H. Fishbach. Aug 73, 17p NASA-TM-X-2860, E-7446

Descriptors: *Computerized simulation, *Power supplies, *Thermoelectric power generation, Equipment specifications, Nuclear reactors, Numerical analysis, Optimization.

For abstract, see STAR 1118

N73-28659/3GA PC$24.75/MF$1.45
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
COMPACT THERMOELECTRIC CONVERTER SYSTEMS TECHNOLOGY.
Final Report.
Jun 73, 453p NASA-CR-121210, WANL-PR(EEE)-055
NASA ORDER C-21029-C, Contract AT(04-3)-701
Subm-Prepared for Atomics Intern.

Descriptors: *Circuit diagrams, *Electronic modules, *Thermionic converters, *Thermoelectric power generation, Lead tellurides, Space power unit reactors, Structural design, Thermionic cathodes, Tube cathodes.

For abstract, see STAR 1119

N73-28661/9GA PC$12.75/MF$1.45
Atomics International, Canoga Park, Calif.
THE 5-KWE REACTOR THERMOELECTRIC SYSTEM SUMMARY.
J. H. Vanosdol. 27 Jul 73, 214p NASA-CR-121241, AI-AEC-13096
Contracts AT(04-3)-701, PROJ. SNAP
Subm-Sponsored by NASA.

Descriptors: *Space power reactors, *Structural design, *Thermoelectric generators, Liquid metal cooled reactors, Performance prediction.

For abstract, see STAR 1119

ORNL-4328/GA PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn.
ORNL ISOTOPIC POWER FUELS QUARTERLY REPORT FOR PERIOD ENDING JUNE 30, 1968.
E. Lamb. Sep 68, 43p
Contract W-7405-eng-26

Descriptors: (*Radioisotope heat sources, *Research programs), (*Capsules, *Fabrication), (*Curium oxides, *Thermodynamic properties), (*Titanium oxides, *Thermal conductivity), Brazing, Chemical reactions, Curium 244, Design, Helium, Leaching, Molybdenum, Plutonium oxides, Plutonium 238, Rhenium alloys, Snap 21 battery, Snap 23 battery, Strontium oxides, Strontium 90, Tantalum, Tantalum alloys, Tungsten, Tungsten alloys, Ultrasonic testing, Welded joints, Welding.

For abstract, see NSA 28 03, number 05861.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-767 616/6GA PC$3.00/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
THE RAPID DETERMINATION OF VOLATILE MATTER BY THE MYTRON FAB-1 MOISTURE METER.
Technical note,
R. J. J. Simkins, and Jean Squire. Mar 73, 50p Rept no. ERDE-TN-82 DRIC-BR-3665

Descriptors: (*Ammunition propellants, Vapors), Meters, Smokeless propellants, Nitrocellulose, Vinyl plastics, Nitrates, Sodium compounds, Stannates, Drying, Vaporization.
Identifiers: Analyzers, Sodium stannates.

The use of a Mytron FAB-1 moisture tester for the determination of the volatile matter content of certain propellant ingredients was investigated and compared with other conventional VM determinations. This instrument was found to be suitable for nitrocellulose and for cordite pastes, and could be used for polyvinyl nitrate and sodium stannate. Although inherently less accurate, the Mytron gave better precision than conventional methods. Considerable savings in time were possible. (Author)

AD-767 618/2GA PC$3.00/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
COMPATIBILITY TESTING OF PRIMARY EXPLOSIVES AND PYROTECHNICS.
Technical rept.,
N. J. Blay, and I. Dunstan. Feb 73, 30p Rept no. ERDE-TR-115 DRIC-BR-34932

Descriptors: (*Explosive materials, Stability), Pyrotechnics, Thermal stability, Chemical contamination, Chemical reactions, Azides, Compatibility, Storage, Great Britain.
Identifiers: Lead azides.

The report consists of the text of a paper given at the second symposium on chemical problems con-

nected with the stability of explosives, Sweden. A general account is given of the main factors involved in the compatibility testing of primary explosives and pyrotechnics, and test procedures are described for examining their compatibility with materials used either in contact or close proximity. Some results are discussed, particularly with reference to the behavior of lead azide. (Author)

BNWL-SA-4499/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
MINICOMPUTER CONTROLLED AMMUNITION CASE SURFACE FLAW INSPECTION SYSTEM.
M. D. Erickson, and M. R. Compton. 1973, 19p
CONF-730508-2

Descriptors: (*Containers, *Inspection), (*Optical systems, *Lasers), Computers, Explosives, On-line systems, Surfaces.

For abstract, see NSA 28 03, number 07668.

LA-UR-73-471/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NEW METHODS OF EED RF TESTING.
R. M. Joppa, and R. W. Freyman. 1973, 13p
CONF-730615-1

Descriptors: (*Explosives, *Nondestructive testing), Electromagnetic radiation, Impedance, Mathematical models, Radiowave radiation.

For abstract, see NSA 28 03, number 07735.

MLM-2051/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
RAPID IDENTIFICATION OF SOME EXPLOSIVES BY THE USE OF SPOT TESTS.
D. M. Colman. 18 May 73, 6p
Contract AT-33-1-GEN-53

Descriptors: (*Explosives, *Qualitative chemical analysis), Color, Testing.

For abstract, see NSA 28 03, number 07742.

PATENT-3 678 859/GA Not available NTIS
Department of the Air Force Washington D C
TWO STAGE IMPACT FUZE.
Patent,
Jerry J. Wesson, and Thomas W. Boulter. Filed 6 Oct 70, patented 25 Jul 72, 7p Rept nos. PAT-APPL-90 184,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Impact fuzes, *Patents), Fuze functioning elements, Projectile fuzes, Safety, Impact, Pressure.
Identifiers: PAT-CL-102-76-R.

The patent relates to a two-stage omni-directional impact fuze having a firing pin assembly and a rotor containing a detonator. A pressure actuated locking arm assembly allows for the rotation of the rotor to the first stage arming position, while the removal of a wind tab allows for the rotation of the rotor to the second stage or fully armed position. In this position under impact in any direction a spherical weight located adjacent to the firing pin assembly causes movement thereof against the detonator and subsequent detonation of the fuze. It is this pressure actuation in conjunction with two-stage arming and omni-directional impact detonation which makes this fuze extremely safe and reliable in operation.

PATENT-3 698 319/GA Not available NTIS
Office of the Secretary of the Army Washington D C
HIGH TEMPERATURE-RESISTANT WATERPROOF CASELESS PRIMER.
Patent,
Joseph B. Quinlan, and Earl F. Van Artsdalen. Filed 8 Jun 71, patented 17 Oct 72, 4p Rept nos. PAT-APPL-151 087,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Primers, *Patents), (*Small arms ammunition, *Complete rounds), Explosive materials, Moisturepreofing, Sensitivity, Cook-off, Temperature.
Identifiers: PAT-CL-102-45, Caseless ammunition.

The patent relates to a combustible primer for use with caseless small arms ammunition, the primer being resistant to water, and elevated temperatures and less prone to accidental ignition and cook-off. The primer pellet is completely surrounded by energetic, high-temperature resistant, waterproofing seals, none of which require any liquid binder for room temperature pressure bonding thereof.

PATENT-3 705 549/GA Not available NTIS
Office of the Secretary of the Army Washington D C
AMMUNITION.
Patent,
Joseph B. Quinlan, and John J. Scanlon, Jr. Filed 25 Nov 70, patented 12 Dec 72, 4p Rept nos. PAT-APPL-92 758,
Previously filed as PAT-APPL-749 642, 2 Aug 68.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Ammunition, *Patents), Propelling charges, Projectiles, Molding, Interior ballistics.
Identifiers: PAT-CL-102-40, Caseless ammunition.

The patent relates to caseless and semi-caseless rounds of ammunition produced at very high production rates in which a molded cylinder of propellant charge has a maximum of impact strength. A support tube of combustible material lines the cylinder inner surface and its forward end receives a projectile that may seat against a bullet support plug, the plug and projectile being secured to the tube inner surface by a film of combustible adhesive. Similar adhesive secures the tube to the molded cylinder, and a primer disc or stub obturator to the tube.

PATENT-3 706 279/GA Not available NTIS
Office of the Secretary of the Army Washington D C
COMBUSTIBLE CARTRIDGE CASE.
Patent,
Theodore Zimmerman. Filed 20 Jan 71, patented 19 Dec 72, 4p Rept nos. PAT-APPL-107 910,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Cartridge cases, *Patents), Complete rounds, Joining, Fibers.
Identifiers: *Cobustible cartridge cases, PAT-CL-102-43-R, Sewing.

The patent is relative to two or more fully combustible components assembled to form a cartridge case by a fully combustible thread stitching adjoining portions of the components.

PATENT-3 706 280/GA Not available NTIS
Office of the Secretary of the Army Washington D C
NOVEL COMBUSTIBLE CARTRIDGE CASE AND PROCESS THEREFORE.
Patent,
Filed 29 Dec 70, patented 19 Dec 72, 6p Rept nos. PAT-APPL-102 540,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Cartridge cases, *Patents), Complete rounds, Cellulose, Nitrocellulose, Organic compounds, Impregnation.
Identifiers: PAT-CL-102-43, Combustible cartridge cases.

The invention relates to novel felted combustible cartridge casing material and to a method for making the same. More particularly, the invention relates to novel felted combustible cartridge cases of excellent tensile strength, water resistance and combustibility.

PATENT-3 706 609/GA Not available NTIS
Office of the Secretary of the Army Washington D C
TNT COMPOSITION CONTAINING A CELLULOSIC RESIN WHICH IS FREE FROM OILY EXUDATION UPON STORAGE.
Patent,
H. William Voigt, Jr., Lawrence W. Pell, and Jean P. Picard. Filed 29 Dec 70, patented 19 Dec 72, 6p Rept nos. PAT-APPL-102-541,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*TNT, *Patents), (*Cellulosic plastics, TNT), Additives, Reclamation, Nitrocellulose, Purification, Viscosity.
Identifiers: PAT-CL-149-18.

The patent concerns a castable high explosive composition of the 2,4,6-trinitrotoluene (TNT) variety containing a cellulosic resin having a thermoplastic nature. A method is discussed for incorporating a thermoplastic resin of the cellulosic variety into a castable high explosive composition containing TNT by initially coating such cellulosic resin on the surface of a finely divided solid explosive and then uniformly dispersing the latter throughout the castable composition.

PATENT-3 706867/GA Not available NTIS
Office of the Secretary of the Army Washington D C
ELECTRONIC ANTI-INTRUSION DEVICE.
Patent,
Henry T. Rand, Maxine Bohacz, Jerry Lyon, Robert L. Pitman, and Donald N. Shaw. Filed 18 Feb 71, patented 19 Dec 72, 5p Rept nos. PAT-APPL-116 362,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Time-delay fuzes, *Patents), (*Warning systems, *Aerial mines), Arming devices, Timing circuits, Delay circuits, Miniature electronic equipment.
Identifiers: PAT-CL-200-61-52, Perimeter defense.

The invention relates to a time delay fuze and has particular reference to an electronic anti-intrusion device which may be mechanically dispersed over an area for which constant surveillance is desired.

PATENT-3 724 375/GA Not available NTIS
Department of the Navy Washington D C
ILLUMINATING FLARE HAVING HIGH DRAG CONFIGURATION.
Patent,
Burton H. Calkins, Dale L. Carstens, and James J. Riester. Filed 6 Apr 70, patented 3 Apr 73, 3p Rept nos. PAT-APPL-31 040,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Aircraft flares, *Patents), Illumination, Aerodynamic characteristics, Drag, Arming devices.
Identifiers: PAT-CL-102-31.

The patent relates to a flat, circular flare having a thin-walled plastic case containing a disk of

pyrotechnic material provided with a star-center and having a fuze means for igniting said pyrotechnic material. The flat, circular flare is launched from an aircraft by spinning and the flare floats or sails to the ground while burning.

PATENT-3 726 728/GA Not available NTIS
Department of the Navy Washington D C
BINDERLESS CAST PHOTOFLASH COMPOSITIONS.
Patent,
Howard W. Kruse, Bertram A. Breslow, and Raymond W. Szypulski. Filed 20 Apr 70, patented 10 Apr 73, 2p Rept nos. PAT-APPL-30 328,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Photoflash bombs, *Patents), (*Photoflash cartridges, Patents), Aluminum, Perchlorates, Sodium compounds, Lithium compounds, Ammonium perchlorate, Calcium compounds.
Identifiers: PAT-CL-149-17, Calcium perchlorates, Sodium perchlorate, Lithium perchlorate.

The invention relates to a binderless cast photoflash composition consisting of a low-melting inorganic oxidizer and a powdered metal. Photoflash cartridges and bombs used in night aerial reconnaissance photography contain a loose-powder pyrotechnic charge which is a metal and an oxidizer in a finely divided condition. These photoflash powders are hazardous in any quantity in that they are highly sensitive to impact, friction, and static electricity. The present invention provides a photoflash composition which is comparatively safe to manufacture and handle.

UCID-15623(Rev.1)/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Radiation Lab.
ANALYSIS OF PLASTIC-BONDED EXPLOSIVES CONTAINING HMX, AMMONIUM PERCHLORATE, ALUMINUM, AND VITON.
W. Selig, and G. L. Crossman. 14 Jun 71, 6p
Contract W-7405-eng-48

Descriptors: (*Chemical explosives, *Chemical analysis), Aluminium, Ammonium compounds, Perchloric acid, Viton.

For abstract, see NSA 28 03, number 07801.

UCID-16189/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
JWL EQUATION OF STATE COEFFICIENTS FOR HIGH EXPLOSIVES.
E. Lee, M. Finger, and W. Collins. 16 Jan 73, 8p
Contract W-7405-eng-48

Descriptors: (*Chemical explosives, *Equations of state).

For abstract, see NSA 28 03, number 07802.

19D. Explosions, Ballistics, and Armor

AD-767 534/1GA PC$3.50/MF$1.45
Frankford Arsenal Philadelphia Pa
AN IMPROVED TIME OF FLIGHT APPROXIMATOR FOR TRAJECTORY ESTIMATION.
Technical note,
Brian D. Wenocur. Jan 73, 73p Rept no. FA-TN-1173

Descriptors: (*Projectile trajectories, Mathematical prediction), Fire control computers, Lead angle, Exterior ballistics, Mathematical models, Impact prediction, Least squares method, Computer programs.
Identifiers: Time of flight, M-246 projectiles.

The problem of numerical processor selection for use in a time of flight submodel has been examined. A one-step method of evaluation for time of flight as a function of range has been formulated which maintains accuracy to within 1% over the range zero to 2000 meters for the M246 projectile. This computerized method runs about 38 times as fast as the more widely applicable differential equation solver, while explicitly accounting for ballistic parameters not present in the inaccurate one-step submodel which it replaces. Statistical variation in times of flight are also considered. Several methods of evaluating the drag coefficient and its statistical variation as functions of velocity from doppler radar data have been explored. The most successful one treated involves obtaining a least square fit for velocity data as a function of time. A rootfinder then evaluates the analytic derivative at a tabular velocity value. (Author)

AD-767 547/3GA PC$4.25/MF$1.45
Avco Systems Div Wilmington Mass
REMOTELY MONITORED BATTLEFIELD SENSOR SYSTEM. TDV (TERMINAL DELIVERY VEHICLE) PENETRATION TESTS INTO FROZEN SAND.
Final rept. Nov 72-May 73,
Charles M. Conlon, Jr. Sep 73, 116p Rept no. AVSD-0293-73-RR
Contract DAAA21-73-C-0188

Descriptors: (*Sand, Penetration), (*Projectiles, Terminal ballistics), Ogives, Impact tests, Angle of attack, Cratering, Predictions, Impact.
Identifiers: TDV(Terminal Delivery Vehicles), Terminal delivery vehicles, Computerized simulation, Frozen soils.

The program was conducted to study the penetration characteristics of the Terminal Delivery Vehicle into frozen soil. The study and tests were conducted for impact velocities of 200, 400 and 600 feet per second. In the analytical study, impact angles of 0, 15 and 45 degrees to the vertical and angles of attack of plus or minus 5 and plus or minus 10 degrees were included. The contractor's Two-Dimensional Impact and Penetration Computer Program was used to predict penetration depths and time history of applied loads to the TDV during the impact and penetration event. Accurate correlation was achieved between the tests and the computer simulations. Predictive analysis was conducted on 90 different impact situations into frozen sand to determine those impacts that result in successful TDV implantation. (Author)

CEA-CONF-2183/GA PC$4.25/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
PROGRAM APEX. EXPERIMENTAL AND THEORETICAL STUDIES OF CRATER DIMENSIONS OF CHEMICAL EXPLOSIONS IN SOME SOILS.
J. Gautier, and P. Perroud. Mar 72, 45p CONF-721108-8
In French. U.S. Sales Only.

Descriptors: (*Soils, Chemical explosions), (*Rocks, Chemical explosions), (*Chemical explosions, *Craters), Clays, Sand, Underground explosions.

For abstract, see NSA 28 03, number 07672.

MHSMP-73-6/GA PC$3.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. Development Div.
REDUCTION OF C--J PRESSURE TEST DATA.
P. E. Kramer, and R. W. Ashcraft. Dec 72, 13p

Descriptors: (*Explosions, *High pressure), (*Explosives, High pressure), Equations of state, Mathematical models, Shock waves.

For abstract, see NSA 28 03, number 07741.

N73-27782/4GA PC$5.75/MF$1.45
Defence Research Establishment Valcartier (Quebec).
ON THE PREDICTION OF CRATER PROFILES PRODUCED IN DUCTILE TARGETS BY THE IMPACT OF RIGID PENETRATORS AT BALLISTIC VELOCITIES.
P. N. Brooks. Jan 73, 73p DREV-R-686/73

Descriptors: *Elastic deformation, *Elastic media, *Impact tests, *Projectile cratering, Numerical analysis, Stress concentration, Terminal ballistics.

For abstract, see STAR 1118

N73-28923/3GA PC$3.75/MF$1.45
Institut Franco-Allemand de Recherches, St. Louis (France).
BIBLIOGRAPHIC AND CRITICAL ANALYSIS OF STUDIES OF SECONDARY SOLID EXPLOSIVES' SENSITIVITY TO SHOCK WAVES ANALYSE BIBLIOGRAPHIQUE ET CRITIQUE DES ETUDES DE SENSIBILITE A L'ONDE DE CHOC DES EXPLOSIFS SECONDAIRES CONDENSES.
C. Fauquignon, and Y. Delongueville. 4 Jan 73, 32p ISL-2/73
Contract SNPE-18/72/D
Language in French.

Descriptors: *Explosives, *Initiation, *Shock resistance, *Shock waves, Bibliographies, Detonation, Hugoniot equation of state, Initiators (Explosives), Loads (Forces), Sensitivity.

For abstract, see STAR 1119

SLA-73-5388/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PROPOSED ELECTROSTATIC SENSITIVITY DEVELOPMENT TESTER.
D. T. Weems. 8 Mar 73, 10p CONF-730504-1

Descriptors: (*Explosives, *Detonations), Electronic equipment, Electrostatics, Sensitivity, Testing.

For abstract, see NSA 28 03, number 07794.

UCRL-Trans-10654/GA PC$3.25/MF$1.45
CALCULATION OF THE CRACK-LENGTH VARIATION WITH THE BOREHOLE DIAMETER FOR A CONSTANT QUANTITY OF EXPLOSIVE PER METER.
F. Ouchterlony. 21p CONF-710228-1
Translated from Conference on Rock Mechanics, 12 February 1971, Stockholm, Sweden.

Descriptors: (*Underground explosions, *Boreholes), (*Rocks, Underground explosions), Cracks, Economics, Mass, Safety.

For abstract, see NSA 28 03, number 07817.

Y-1873/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
EXPLOSIBILITY TEST FACILITY FOR POWDERS.
J. D. Lore, and J. E. Miller. 4 May 73, 30p
Contract W-7405-eng-26

Descriptors: (*Powders, *Explosions), (*Aluminium, Explosions), (*Magnesium, Explosions), Mechanical structures, Testing.

For abstract, see NSA 28 03, number 07828.

19E. Fire Control and Bombing Systems

AD-767 074/8GA PC$3.00/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md
FIELD ARTILLERY FIRE CONTROL SIGHTS.
Final rept. on test operations procedure.

26 Feb 73, 43p Rept no. TOP-3-2-709

Descriptors: (*Fire control systems, Test methods), (*Artillery, Fire control systems), Artillery fire, Optical sights, Boresighting, Fire control systems components, Environmental tests, Firing tests(Ordnance).
Identifiers: *Common engineering test procedures.

The report provides a method of evaluating the performance of optical-mechanical sighting systems used to lay the major armament of towed and self-propelled artillery. It includes test preparations, techniques for checking boresight retention, alignment of panoramic telescope, synchronization, and other features, road tests on rugged test courses, firing tests covering ambient and extreme temperatures, solar radiation, and night performance, rain test, and humidity test. It describes methods for determining azimuth error, testing accuracy of cant corrector, and illustrating test results. (Author)

AD-767 253/8GA PC$3.00/MF$1.45
Frankford Arsenal Philadelphia Pa
MISS DISTANCE RESULTING FROM INPUT ERRORS FOR GUN AIR DEFENSE SYSTEMS.
Memorandum rept.,
Thomas H. Slook, Samuel Yosen, and Alice M. Jones. Jun 73, 41p Rept no. FA-M73-18-1

Descriptors: (*Antiaircraft gunnery, *Miss distance), (*Antiaircraft defense systems, Antiaircraft gunnery), Errors, Projectile trajectories, Gun mounts, Antiaircraft guns, Range tables, Lead angle, Fire control computers, Computer programs.
Identifiers: FORTRAN, CDC 6600 computers.

The report gives, for the antiaircraft problem of level flight, constant speed and any ballistic data, the mathematical analysis, and a FORTRAN program of projectile-target miss distance as a function of errors in slant range, slant range rate, azimuth, azimuth rate, elevation, elevation rate, and gun-platform out-of-level. The FORTRAN program prints a miss distance table as a function of the above errors for equal increments in predicted slant range, present slant range, or target time along course. The program also provides the option of printing discrete graphs of miss distance as a function of target time along course for each of the above errors sources. A second FORTRAN program gives projectile-target miss distance as a function of errors in projectile time of flight. (Author)

19G. Rockets

AD-767 237/1GA PC$3.00/MF$1.45
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate
TECHNIQUES FOR REDUCING THE VIBRATION OF ROCKET LAUNCHERS MOUNTED ON HELICOPTERS.
Technical rept.,
C. D. Johnson. 15 Aug 72, 38p Rept no. RL-TR-72-1

Descriptors: (*Rocket launchers, *Vibration isolators), (*Helicopters, Weapon systems), Vibration, Damping, Resonant frequency, Mounting brackets, Mathematical models, External stores.

The report is concerned with various techniques that might be used to achieve high quality vibration isolation for equipment mounted on a helicopter. Of specific interest is the problem of reducing the rotor induced vibration of externally mounted rocket launchers. Three schemes for reducing rocket launcher vibrations are proposed. The first scheme is along the lines of traditional vibration isolation methods. The second scheme uses a novel device called a 'vibration absorber' which (theoretically) can completely eliminate sinusoidal launcher vibrations - provided the vibration frequencies are constant. The third proposed scheme is somewhat newer, and more exotic, and leads to what can be called an 'active' vibration absorber. (Author)

20. PHYSICS

20A. Acoustics

AD-767 222/3GA PC$4.75/MF$1.45
Army Electronics Command Fort Monmouth N J
THE EFFECT OF HELICOPTER NOISE ON COMMUNICATION AND HEARING.
Research and development technical rept.,
Thomas A. Giordano, and Gerard C. Keane. Aug 73, 160p Rept no. ECOM-4140

Descriptors: (*Helicopters, *Noise), (*Hearing, *Hazards), (*Voice communication systems, Intelligibility), Stress(Physiology), Acoustics, Problem solving, Helmets, Ear protectors, Time, Damage, Microphones, Signal-to-noise ratio.
Identifiers: CH-47 aircraft, *Helicopter noise, Hearing loss, Computer analysis, Noise cancelling microphones.

The effects of CH-47 (CHINOOK) helicopter noise on the aviator's hearing and on communication system intelligibility are serious ones. The effort described by this report is aimed at reducing the sound pressure levels at the aviator's ears while maintaining high intelligibility and quality in the communication system. The overall problem is first defined. The noise levels inside all areas of the CH-47 were found to exceed the hearing damage risk criteria set forth by the Surgeon General. Even with hearing protectors, the aviator is limited to the time he may fly without undue risk to his hearing. The electrical characteristics of the communication system were determined. Nonlinear frequency responses of the microphone and earcup were detected. These resonances cause emphasis of those frequencies in which the ear is most sensitive. The poor noise cancelling ability of the M-87 microphone at high frequencies cause low signal to noise ratios in the communication system. An intelligibility vs. in-ear dBA level study was run to evaluate the potential success of an 'ideal' perfect noise cancelling microphone and other microphone modifications.

AD-767 333/8GA PC$2.75/MF$1.45
Stanford Univ Calif Dept of Computer Science
THE OPTIMUM COMB METHOD OF PITCH PERIOD ANALYSIS OF CONTINUOUS DIGITIZED SPEECH,
James Anderson Moorer. Jul 73, 23p Rept nos. STAN-CS-73-378, AIM-207
Contract SD-183, ARPA Order-457
Report on Stanford Artificial Intelligence Project.

Descriptors: (*Speech, *Sound pitch), (*Data processing systems, *Speech recognition), Digital systems, Sampling, Spectrum analyzers, Binary arithmetic, Curve fitting, Graphics, Artificial intelligence.
Identifiers: *Cepstrum technique, Computational complexity, Waveforms, Frequency response.

A new method of tracking the fundamental frequency of voiced speech is described. The method is shown to be of similar accuracy as the Cepstrum technique. Since the method involves only additions, no multiplication, it is shown to be faster than the SIFT algorithm. (Author)

AD-767 334/6GA PC$3.00/MF$1.45
Stanford Univ Calif Dept of Computer Science
THE HETRODYNE FILTER AS A TOOL FOR ANALYSIS OF TRANSIENT WAVEFORMS,
James Anderson Moorer. Jul 73, 28p Rept nos. STAN-CS-73-379, AIM-208
Contract SD-183, ARPA Order-457
Report on Stanford Artificial Intelligence Project.

Descriptors: (*Music, *Sound pitch), (*Data processing systems, Music), Low-pass filters, Sampling, Harmonic analysis, Graphics, Curve fitting, Fourier analysis, Speech recognition, Artificial intelligence.
Identifiers: Waveforms, Frequency response, Hetrodyne filters, Error analysis, Signal processing.

A method of analysis of transient waveforms is discussed. Its properties and limitations are presented in the context of musical tones. The method is shown to be useful when the risetimes of the partials of the tone are not too short. An extension to inharmonic partials and polyphonic musical sound is discussed. (Author)

AD-767 380/9GA PC$5.75/MF$1.45
Michigan Univ Ann Arbor Cooley Electronics Lab
THE 1971-1972 DEEP OCEAN PROPAGATION EXPERIMENT: PRELIMINARY RESULTS. PART 1. LONG-TERM POWER MEASUREMENTS.
Technical rept.,
Theodore G. Birdsall, Kurt Metzger, Jr., and Christine L. Bell. Sep 73, 75p Rept nos. 036040-17-T, TR-223
Contract N00014-67-A-0181-0032

Descriptors: (*Underwater sound signals, Data processing systems), Power spectra, Algorithms, Programming(Computers), Atlantic Ocean.
Identifiers: *Signal processing, MIMI project, CMP8:15 computer program.

Since 1962 the Signal Processing Group at the Cooley Electronics Laboratory of The University of Michigan and the Acoustics group (now the Institute for Acoustical Research) of the University of Miami have been engaged in a cooperative effort (project MIMI) involving the use of modern propagates in the ocean. In July of 1971 the Miami group installed an acoustic source at the Eleuthera U.S. Naval Facility in the Bahamas. This source was used to conduct a long-term experiment involving deep ocean propagation. The report contains a description of the primary experiment and the data obtained from it. (Author)

AD-767 481/5GA Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
THE EFFECTS OF RELATIVE PHASE AND THE NUMBER OF COMPONENTS ON RESIDUE PITCH.
Research paper,
R. D. Patterson. 22 Dec 72, 9p Rept no. DCIEM-RP-852
Revision of report dated 4 Oct 72.
Availability: Pub. in The Jnl. of the Acoustical Society of America, v53 n6 p1565-1572 1973.

Descriptors: (*Sound pitch, Phase shift), Frequency shift, Power spectra, Harmonic analysis.

The pitch of the residue produced by 6- and 12-component waves whose components were either in cosine or random phase was measured as a function of the frequency region of the components. The components were all of equal amplitude and the frequency spacing between them was 200 Hz. Waves with the same lowest component were found to produce the same pitch: neither the number of components nor the relative phase of the components was important in determining the pitch of the residue. If every component in a wave was a multiple of 200 Hz, the wave produced a 200 Hz pitch; if such a set of components was shifted in frequency by a small amount, there was a corresponding linear shift in the pitch of the residue. When the lowest component in the wave was below about 900 Hz, the slope values associated with the lines relating the pitch shift to the frequency shift varied little from their average value of 0.21. As the lowest component increased from 900 to 2580 Hz the slope values decreased to about 0.08. These findings are

in good agreement with the current model of pitch perception based on interpeak durations. (Author)

N73-26992/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
GEOMETRIC FACTORS AFFECTING NOISE SUPPRESION AND THRUST LOSS OF DIVERGENT-LOBE SUPERSONIC JET NOISE SUPPRESSOR.
R. G. Huff, and D. E. Groesbeck. Jul 73, 25p NASA-TM-X-2820, E-7393

Descriptors: *Cold flow tests, *Divergent nozzles, *Jet aircraft noise, *Noise reduction, *Thrust, Nozzle design, Supersonic flow.

For abstract, see STAR 1118

N73-27591/9GA PC$3.00/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
AN APPLICATION OF CROSS SPECTRAL ANALYSIS TO THE MEASUREMENT OF CONTRIBUTION OF NOISE SOURCES.
Y. Ishii, and M. Ishida. May 72, 9p ISAS-493

Descriptors: *Acoustic measurements, *Noise generators, *Noise spectra, Correlation coefficients, Power spectra, Transfer functions.

For abstract, see STAR 1118

N73-27594/3GA PC$7.75/MF$1.45
North Carolina State Univ., Raleigh. Center for Acoustical Studies.
INVESTIGATION OF THE STATISTICS OF PURE TONE SOUND POWER INJECTION FROM LOW FREQUENCY, FINITE SIZED SOURCES IN A REVERBERANT ROOM.
Ph.D. Thesis.
W. F. Smith. May 73, 112p NASA-CR-132279
Contract NGL-05-018-127

Descriptors: *Noise pollution, *Power spectra, *Sound pressure, Acoustic measurements, Noise generators, Noise reduction, Statistical analysis.

For abstract, see STAR 1118

N73-28655/4GA PC$5.50/MF$1.45
Forschungsinstitut fuer Hochfrequenzphysik, Werthhoven (West Germany).
THE DATA TRANSMISSION SECTION OF THE UNDERWATER SOUND MODEL TEST FACILITY AT WERTHHOVEN DIE DATENUEBERTRAGUNGSSTRECKE DER WERTHHOVENER WASSERSCHALL-MODELL- VERSUCHSANLAGE.
B. Naegele. Nov 72, 68p REPT-5-72
Language in German.

Descriptors: *Fourier analysis, *Signal processing, *Underwater acoustics, Basins (Containers), Data transmission, Digital computers, Hydrophones.

For abstract, see STAR 1119

N73-28669/2GA PC$3.00/MF$1.45
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
MEASUREMENTS OF ACOUSTIC ABSORPTION COEFFICIENT OF BIDIN FOR DIFFERENT DENSITIES, COMPACTING AT VARIOUS DISTANCES FROM AN INFINITE IMPEDANCE WALL, ACCORDING TO ASTM C-384/58.
L. X. Nepemuceno. 27 Feb 73, 9p TR-7302.626
In Portuguese; English Summary.

Descriptors: *Absorptivity, *Acoustic measurements, *Ultrasonic tests, Brazil, Nondestructive tests, Specifications.

For abstract, see STAR 1119

N73-28671/8GA PC$4.50/MF$1.45
Interand Corp., Chicago, Ill.
ACOUSTIC PROCESSING METHOD FOR MS/MS EXPERIMENTS.
Final Report.
R. R. Whymark. Jun 73, 46p NASA-CR-124300, IC-726
Contract NAS8-29030

Descriptors: *Acoustic streaming, *Positioning, *Space manufacturing, Levitation, Lift devices, Sound fields, Sound pressure.

For abstract, see STAR 1119

N73-28731/0GA PC$13.25/MF$1.45
INVESTIGATION OF NOISE SUPPRESSION BY SONIC INLETS FOR TURBOFAN ENGINES. VOLUME 1: PROGRAM SUMMARY.
F. Klujber, J. C. Bosch, R. W. Demetrick, and W. L. Robb. Jul 73, 221p NASA-CR-121126, D6-40855-VOL-1
Contract NAS3-15574

Descriptors: *Acoustic properties, *Aerodynamic configurations, *Engine inlets, *Inlet flow, *Noise reduction, Flow geometry, Pressure distribution, Project management, Research projects.

For abstract, see STAR 1119

N73-28732/8GA PC$13.00/MF$1.45
INVESTIGATION OF NOISE SUPPRESSION BY SONIC INLETS FOR TURBOFAN ENGINES. VOLUME 2: APPENDIXES.
F. Klujber, J. C. Bosch, R. W. Demetrick, and W. L. Robb. Jul 73, 219p NASA-CR-121127, D6-40855-1-VOL-2
Contract NAS2-15574

Descriptors: *Aerodynamic configurations, *Engine inlets, *Inlet flow, *Noise reduction, *Turbofan engines, Acoustic properties, Flow geometry, Pressure distribution, Research projects.

For abstract, see STAR 1119

N73-28733/6GA PC$15.25/MF$1.45
INVESTIGATION OF NOISE SUPPRESSION BY SONIC INLETS FOR TURBOFAN ENGINES. VOLUME 3: AN EXPERIMENTAL INVESTIGATION OF THE INTERNAL NOISE FIELD OF TWO AXISYMMETRIC SONIC INLET MODELS.
F. Klujber, and J. Louisse. Jul 73, 261p NASA-CR-121128, D6-40818-VOL-3
Contract NAS3-15574

Descriptors: *Engine inlets, *Flow characteristics, *Inlet flow, *Noise reduction, *Turbofan engines, Acoustic properties, Aerodynamic configurations, Pressure distribution, Research projects.

For abstract, see STAR 1119

20B. Crystallography

AD-767 165/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE EFFECT OF VARIOUS GROWTH PARAMETERS ON THE FORMATION OF PITS AND HILLOCKS ON THE SURFACE OF EPITAXIAL GAAS LAYERS,
John K. Kennedy, and William D. Potter. 19 Feb 73, 7p Rept no. AFCRL-TR-73-0554
Revision of report dated 20 Dec 72.
Availability: Pub. in Jnl. of Crystal Growth, v19 p85-89 1973.

Descriptors: (*Gallium arsenides, *Epitaxial growth), Surface properties, Defects(Materials), Semiconductors.
Identifiers: Chemical vapor deposition.

Epitaxial layers of GaAs have been deposited using the open tube AsH3 system. The formation of pits and hillocks on the surface of the epitaxial layer was found to be a function of the flowrates of the reactant gases, the total carrier flowrate, and the deposition temperature and was correlated with the variation of the concentration of GaCl present in the deposition zone. (Author)

AD-767 299/1GA PC$3.50/MF$1.45
Monsanto Research Corp St Louis Mo
MAGNETIC BUBBLE MATERIALS.
Final rept. 11 Jan-11Jul 73,
Jerry W. Moody, Robert M. Sandfort, Roger W. Shaw , Michael C. Willson, and Joseph T. Cheng. 11 Aug 73, 64p Rept no. MRC-SL-386
Contract DAAH01-72-C-1098, ARPA Order-1999

Descriptors: (*Crystal growth, Magnetic materials), (*Thin film storage devices, *Magnetic materials), Epitaxial growth, Vapor plating, Rare earths, Garnet, Gadolinium compounds, Gallium arsenides, Oxides, Europium compounds, Ytterbium compounds, Yttrium compounds, Samarium compounds, Single crystals, Magnetic properties, Thermal properties.
Identifiers: *Magnetic bubble domains, Magnetic film storage, Chemical vapor deposition, Czochralski method.

The Czochralski growth of defect-free, non-magnetic garnet crystals and the preparation of epitaxial magnetic bubble garnet films by liquid phase epitaxy (LPE) and arc-plasma spraying (APS) were investigated. Two garnet systems, Eu-Yb-Y and Sm-Y, were identified as being of particular practical interest. These garnets exhibit reasonable mobilities, satisfactory quality factors, and good temperature stability. Device-quality films can be deposited by LPE from PbO-B2O3 solution on (111) GGG substrates. Methods were developed for growing epitaxial garnet films by APS. However, the films were usually contaminated with crystallites of orthoferrite, hematite, magnetoplumbite or other phases. Low defect density films were not prepared and the elimination of unwanted phases by compositional control appears to be a formidable problem. All recent developments indicate that the LPE 'dipping' growth of garnet films is a commercially viable process. Core free single crystals of GGG with defect densities of less than 5 per sq cm can be grown readily by the Czochralski method. Such crystals, up to 38 mm in diameter, are now available commercially. (Author)

AD-767 515/9GA Reprint
Fairchild Industries Inc Farmingdale N Y Fairchild-Republic Div
THE STABILITY OF <C+A> DISLOCATION IN HEXAGONAL CRYSTALS,
L. J. Teutonico. 1970, 12p AFOSR-TR-73-1854
Contract F44620-71-C-0058
Availability: Pub. in Titanium Science and Technology, v2 p1009-1019 n.d. (Plenum Pub. Corp., N. Y.).

Descriptors: (*Dislocations, Stability), Heat of activation, Beryllium.
Identifiers: Hexagonal lattices.

Analytical expressions are given for the energies of dislocations with <a>, <c>, and <c+a> Burgers vectors in a hexagonal crystal. These expressions yield a criterion defining the orientations for which a <c+a> dislocation is stable against dissociation into a <a> dislocation and a <c> dislocation. The influence of elastic constant values on this criterion is discussed. The stability considerations are relevant to the question of nonbasal slip in hexagonal metals. It is shown that, in general, a non-basal slip plane will contain sectors for which a <c+a> dislocation is stable against dissociation, other sectors for which it is not. There is, however, one non-basal plane for which a glissile <c+a> dislocation can be stable for all orienta-

tions; this is the second-order pyramidal plane. (Author)

AERE-R-7319/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
ELECTRON DIFFRACTION DATA FOR SILICON NITRIDE.
J. V. Sharp, A. G. Evans, and B. Hudson. Dec 72, 19p
U.S. Sales Only.

Descriptors: (*Silicon nitrides, *Microstructure), Allotropy, Crystal lattices, Electron diffraction, Electron microscopy.

For abstract, see NSA 28 02, number 03016.

BNL-17748/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y. Louisiana State Univ., New Orleans.
RESOLUTION OF CRYSTALLOGRAPHIC DISORDER BY COUPLED SINGLE CRYSTAL X-RAY-DIFFRACTION AND MOESSBAUER SPECTROSCOPY: STUDY OF THE (PI -(1)-2-THIOLLYL) IRON(II) SYSTEM.
B. R. Davis, I. Bernal, J. Buttone, and M. L. Good. 1972, 9p CONF-730117-2

Descriptors: (*Iron compounds, *Crystal structure), (*Sulfur compounds, Crystal structure), (*Boron compounds, Crystal structure), Moessbauer effect, X-ray diffraction.

For abstract, see NSA 28 03, number 07661.

COM-73-50748/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
DYNAMICAL DIFFRACTION EQUATIONS FOR IMPERFECT CRYSTALS.
Final rept.,
Masao Kuriyama. 1973, 5p
Pub. in Zeitschrift fuer Naturforsch (West Germany) v28a n5 p622-626 1973.

Descriptors: (*Crystals, Diffraction), Theory.

The ray theory of Kato and Kambe for imperfect crystals is derived in a formal way from a general dynamical theory of diffraction. This development together with the results from a previous paper concerning Takagi's equation (the wave theory) helps to clarify the meaning and limits of various phenomenological theories that have been extended to an imperfect crystal from the dynamical diffraction theory for a perfect crystal.

COM-73-50823/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MORPHOLOGICAL STABILITY NEAR A GRAIN BOUNDARY GROOVE IN A SOLID-LIQUID INTERFACE DURING SOLIDIFICATION OF A BINARY ALLOY.
Final rept.,
R. F. Sekerka. 1973, 9p
Pub. in Jnl. of Crystal Growth (netherlands) v19 p285-293 1973.

Descriptors: (*Solidification, *Alloys), (*Crystal growth, Alloys), Grain boundaries, Stability, Liquidus, Solidus, Perturbation, Morphology, Numerical analysis.

In order to further explore the influence of grain boundaries on the phenomenon of morphological stability, the authors have extended their previous treatment for a pure substance to a binary alloy. For unidirectional solidification at constant velocity, the shape, y = W(x,t), of a nearly planar interface, intersected perpendicularly by a grain boundary, is calculated. The stability-instability criterion is identical to that for an interface without a grain boundary. If the interface is unstable, the main influence of the grain boundary is to provide an initial perturbation and the time evolution of the interface shape can be treated by approximate analytical methods.

COM-73-50825/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MORPHOLOGICAL STABILITY NEAR A GRAIN BOUNDARY GROOVE IN A SOLID-LIQUID INTERFACE DURING SOLIDIFICATION OF A PURE SUBSTANCE.
Final rept.,
S. R. Coriell, and R. F. Sekerka. 1972, 15p
Pub. in Jnl. of Crystal Growth (Netherlands) v19 p90-104 1972.

Descriptors: (*Crystal growth, *Solidification), (*Grain boundaries, Solidifcation), Morphology, Crystal defects, Liquidus, Numerical analysis, Stability, Solidus, Perturbation.

In order to explore the influence of a specific type of defect on the phenomenon of morphological instability, the authors have calculated the time-dependent shape of a nearly planar interface, intersected perpendicularly by a grain boundary, during solidification of a pure substance at constant velocity. The calculational methods and principal assumptions are similar to those employed in previous theories of morphological stability except that the slope of the interface is maintained at a finite and constant value, s, in the immediate vicinity of the grain boundary groove. A meaningful criterion for instability is shown to be the exponential growth of perturbations while, conversely, stability entails their exponential decay; phenomena such as the algebraic increase of amplitude characteristic of thermal grooving are shown to be manifestations of constraints.

ITF-72-92-P/GA PC$4.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
INELASTIC SCATTERING OF SLOW NEUTRONS BY IMPURITY CRYSTALS. II. PECULIARITIES OF SCATTERING CROSS-SECTION IN THE RESONANCE FREQUENCY REGION OF SUBSTITUTIONAL ATOMS.
I. P. Dzyub, and V. Z. Kochmarskii. 1972, 40p
In Russian. U.S. Sales Only.

Descriptors: (*Crystals, *Phonons), (*Slow neutrons, *Inelastic scattering), Atoms, Cross sections, Distribution functions, Impurities.

For abstract, see NSA 28 02, number 03190.

LBL-1404/GA PC$9.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
CHEMICAL TRANSPORT REACTION ANALYSIS FOR CRYSTAL GROWTH OF BINARY AND TERNARY CHALCOGENIDES.
R. B. Agnihotri. Dec 72, 137p
Contract W-7405-eng-48

Descriptors: (*Chalcogenides, *Crystal growth), Chemical reaction kinetics, Electrical properties, Equilibrium, Gaseous diffusion, Luminescence, Magnetic properties, Optical properties.

For abstract, see NSA 28 02, number 05043.

N73-27596/8GA PC$4.50/MF$1.45
Boeing Aerospace Co., Huntsville, Ala.
STUDY OF LIQUID-SOLID TRANSITION FOR MATERIALS PROCESSING IN SPACE. ANALYSIS OF FIELD EFFECTS ON DENSE LIQUID MATERIALS.
Final Report.
R. I. Miller. 9 May 73, 47p NASA-CR-124294, D5-17254
Contract NAS8-28664

Descriptors: *Magnetic effects, *Space manufacturing, *Transition points, *Weightlessness, Crystal growth, Diffusion coefficient, Field theory (Physics).

For abstract, see STAR 1118

N73-27677/6GA PC$3.00/MF$1.45
Southern Methodist Univ., Dallas, Tex. Electronic Sciences Center.
PHYSICAL PHENOMENA RELATED TO CRYSTAL GROWTH IN THE SPACE ENVIRONMENT.
T. L. Chu. Jul 73, 38p NASA-CR-2281
Contract NAS1-11869

Descriptors: *Crystal growth, *Space manufacturing, Containerless melts, Convection, Diffusion coefficient, Experimental design, Silicon.

For abstract, see STAR 1118

Y-1879/GA PC$4.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
CALCULATED POWDER X-RAY DIFFRACTION DATA FOR BORON.
C. E. Jr. Holcombe, and A. L. Jr. Coffey. 25 May 73, 16p
Contract W-7405-eng-26

Descriptors: (*Boron, *Powders), Computer calculations, Crystallography, Data, Reviews, Solid solutions, Tables, X-ray diffraction.

For abstract, see NSA 28 03, number 06387.

20C. Electricity and Magnetism

AD-767 387/4GA PC$2.75/MF$1.45
Rochester Univ N Y School of Medicine and Dentistry
EFFECT OF EXTREMELY LOW FREQUENCY ELECTRIC AND MAGNETIC FIELDS ON ROOTS OF 'VICIA FABA'.
Final rept.,
Morton W. Miller. 2 Oct 73, 10p
Contract N00014-67-A-0398-0011

Descriptors: (*Plants(Botany), *Electromagnetic fields), (*Radiobiology, Electromagnetic fields), Mitosis, Growth, Genetics, Physiology.
Identifiers: Vicia faba.

Roots of Vicia faba were exposed to electric and magnetic fields comparable to those of Project SANGUINE. There were no differences among control and exposed roots for growth or mitotic index. Also, there were no chromosomal anomalies. (Author)

AD-767 486/4GA Reprint
Delaware Univ Newark Dept of Mathematics
DIPOLE MOMENTS AND NEAR FIELD POTENTIALS,
Ralph E. Kleinman. 29 Mar 72, 8p AFOSR-TR-73-1834
Grant AF-AFOSR-1794-69
Revision of report dated 21 Jul 71.
Availability: Pub. in Applied Scientific Research, v27 p335-340 Apr 73.

Descriptors: (*Electromagnetic fields, *Dipole moments), Integral equations, Scattering.

Expressions are derived for the moments of electric and magnetic dipoles whose far field is equivalent to the Rayleigh term in the far field of a given radiating electromagnetic field. The equivalent dipole moments are expressed as integrals over an arbitrary closed surface of the near electromagnetic fields and simplification is achieved by rewriting these expressions in terms of the static potentials from which the near fields are derived. The results are valid regardless of the complexity of the field and the medium within the integration surface as long as the exterior is homogeneous, isotropic and source-free. (Author)

AD-767 585/1GA Reprint
Rockefeller Univ New York Dept of Physics

THE ONE-DIMENSIONAL X-Y MODEL IN INHOMOGENEOUS MAGNETIC FIELDS,
K. M. Case, and C. W. Lau. 22 Dec 72, 14p
AFOSR-TR-73-1882
Grant AF-AFOSR-2187-72
Revision of report dated 16 Aug 72.
Availability: Pub. in Jnl. of FATHEMATICAL Physics, v14 n6 p720-732 Jun 73.

Descriptors: (*Magnetic fields, Mathematical models), Magnetic moments, Functions, Integrals.
Identifiers: Eigenvalues.

The one-deimensional X - Y model in various kinds of inhomogeneous magnetic fields is analyzed. In each case the spectrum and eigenfunctions of the system is found and the equilibrium and relaxation behavior of the magnetization of any spin site is studied. (Author)

NP-19725/GA PC$3.25/MF$1.45
Scientific Research Inst. Of Electro-Physical Apparatus, Leningrad (Ussr).
NUMERICAL SIMULATION OF TWO-DIMENSIONAL QUASI-STATIONARY ELECTROMAGNETIC FIELDS. PREPRINT B-0169.
N. I. Doinikov. 1972, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Electromagnetic fields, *Two-dimensional calculations), (*Electrodynamics, *Numerical solution), Algorithms, Eddy currents, Magnetic fields.

For abstract, see NSA 28 02, number 05049.

N73-28672/6GA PC$3.00/MF$1.45
Michigan Univ., Ann Arbor. Radiation Lab.
ON ELECTROMAGNETIC FIELD PROBLEMS IN INHOMOGENEOUS MEDIA.
A. Mohsen. Jan 73, 16p NASA-CR-132286, REPT-010106-2-T
Contract NGR-23-005-477

Descriptors: *Electromagnetic fields, *Wave propagation, Differential equations, Electromagnetic scattering, Inhomogeneity, Integral equations.

For abstract, see STAR 1119

PATENT-3 706 001/GA Not available NTIS
Office of the Secretary of the Army Washington D C
THERMIONIC ELECTRON EMITTER CONTAINING THORIUM CARBIDE, THORIUM OXIDE AND ZIRCONIUM CARBIDE.
Patent,
Thomas J. Nall. Filed 15 Mar 71, patented 12 Dec 72, 1p Rept nos. PAT-APPL-124 608,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Thermionic emission, *Patents), Thorium compounds, Oxides, Carbides, Zirconium compounds, Cathodes(Electron tubes).
Identifiers: *Thermionic emitters, PAT-CL-313-346-DC, Thorium oxides, Thorium carbides, Zirconium carbides.

The patent describes an improved thermionic electron emitter containing thorium carbide, thorium oxide and zirconium carbide.

PATENT-3 731 374/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
METHOD OF FABRICATING A HARD INTERMETALLIC SUPERCONDUCTOR BY MEANS OF DIFFUSION.
Patent,
Masaki Suenaga, William B. Sampson, and David H. Gurinsky. Filed 20 Jul 71, patented 8 May 73, 7p PAT-APPL-164 362
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Superconductors, *Patents), Fabrication, Fiber composites, Vanadium intermetallics, Gallium intermetallics, Diffusion, Filaments, Metal fibers, Copper alloys, Gallium containing alloys, Metal coatings, Gallium.
Identifiers: Metal matrix composites.

The patent describes a method of providing fine superconductors in a metal matrix wherein solid-state diffusion of a selected component from the matrix takes place and is 'enhanced' by an externally added component to provide a desired superconductor alloy in the matrix.

SGAE-PH-139/73/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Physik-Institut.
AN ANALYTICAL METHOD FOR THE CALCULATION OF STATIONARY SELF-CONSISTENT SPACE CHARGE FIELDS.
P. W. Krempl. Feb 73, 12p CONF-720948-15, SGAE-2086
U.S. Sales Only.

Descriptors: (*Ion beams, *Space charge), Cations, Differential equations, Distribution, Equations, Field theories, Geometry, Linear momentum, Mathematical space, Metrics, Motion, Poisson equation, Surfaces, Tensors, Velocity.

For abstract, see NSA 28 02, number 03733.

20D. Fluid Mechanics

AD-767 061/5GA PC$9.75/MF$1.45
Woods Hole Oceanographic Institution Mass
NOTES ON THE 1972 SUMMER STUDY PROGRAM IN GEOPHYSICAL FLUID DYNAMICS AT THE WOODS HOLE OCEANOGRAPHIC INSTITUTION. VOLUME I.
1972, 153p Rept no. WHOI-Ref-72-79-vol-1
Contract N00014-72-C-0452
See also report dated 1972, AD-767 062.

Descriptors: (*Fluid flow, Symposia), Ocean waves, Atmospheric motion, Convection(Atmospheric), Turbulence, Thermoclines, Gravity, Reynolds number, Vortices, Numerical analysis.
Identifiers: *Stratified flow, *Stratified fluids, Internal gravity waves, Air water interactions, Boussinesq approximation, Turbulent flow, *Fluid dynamics.

Contents: The Boussinesq approximation; small amplitude internal gravity waves; wave-wave interaction; the effects of stratification on rotating critical flow; experiments in stratified fluids; double-diffusive convection; classification of mixing mechanisms in a stratified fluid; convection from isolated sources; convection in layers; shear instabilities and turbulent gravity currents; mechanical mixing across density interfaces; external mixing processes in the oceans and atmosphere; stratified turbulent shear flows; transports in very stable conditions. A series of abstracts complete the report.

AD-767 062/3GA PC$7.75/MF$1.45
Woods Hole Oceanographic Institution Mass
NOTES ON THE 1972 SUMMER STUDY PROGRAM IN GEOPHYSICAL FLUID DYNAMICS AT THE WOODS HOLE OCEANOGRAPHIC INSTITUTION. VOLUME II.
1972, 115p Rept no. WHOI-Ref-72-79-Vol-2
Contract N00014-72-C-0452
See also report dated 1972, AD-767 061.

Descriptors: (*Fluid flow, Symposia), Ocean currents, Ocean bottom topography, Atmospheric motion, Dispersion relations, Integration, Numerical analysis, Power spectra.
Identifiers: Rossby waves, *Stratified flow, *Stratified fluids, Air water interactions, *Fluid dynamics.

Contents: Baroclinic flow over an obstacle in a rotating system; thermal and Taylor instabilities in a rapidly rotating annulus; Taylor columns for small Rossby numbers; rectified currents generated by waves and topography; Taylor columns and Rossby wakes generated by isolated topographic features on a beta-plane; on the determination of internal wave parameters; the calculation of nonlinear interfacial waves.

AD-767 236/3GA PC$3.00/MF$1.45
Army Missile Command Redstone Arsenal Ala Aerobalistics Directorate
THE VISCOUS INTERACTION OF INCOMPRESSIBLE SEPARATED FLOWS.
Technical rept.,
Wen L. Chow, and Donald J. Spring. 17 Aug 73, 30p Rept no. RD-73-22

Descriptors: (*Flow separation, Incompressible flow), (*Two-dimensional flow, Mathematical analysis), Interactions, Wake, Axially symmetric flow, Shear stresses, Jet mixing flow.
Identifiers: Inviscid flow, Viscous flow.

The two-dimensional incompressible separated flow problem is analyzed by establishing a corresponding inviscid free streamline flow field which can be constructed by the method of conformal mapping.

AD-767 483/1GA Reprint
Michigan Univ Ann Arbor Dept of Engineering Mechanics
WAVE VELOCITY IN PARALLEL FLOWS OF A VISCOUS FLUID,
Chia-Shun Yih. 8 Dec 72, 6p
Sponsored in part by Office of Naval Research, Arlington, Va. and National Science Foundation, Washington, D.C.
Availability: Pub. in Jnl. of Fluid Mechanics, v58 n4 p703-708 1973.

Descriptors: (*Fluid flow, Velocity), Reynolds number, Viscosity, Complex variables.
Identifiers: Viscous flow, Couette flow, Poiseuille flow, Phase velocity.

It is shown in the note that the velocity of unstable or neutral waves in plane Poiseuille flow or plane Couette-Poiseuille flow, or of axisymmetric waves in Poiseuille flow, stable or unstable, must lie within the range of the velocity of the flow. (Author)

AD-767 598/6GA PC$3.00/MF$1.45
Polytechnic Inst of Brooklyn N Y Dept of Aerospace Engineering and Applied Mechanics
INTERNAL HYPERSONIC FLOW,
T. C. Lin, and S. G. Rubin. Mar 73, 34p Rept no. PIBAL-73-4 AFOSR-TR-73-1694
Grant AF-AFOSR-1843-70

Descriptors: (*Ducts, Hypersonic flow), Pipes, Flow fields, Laminar boundary layer, Shock waves, Pressure, Skin friction, Numerical analysis.
Identifiers: Finite difference theory.

Hypersonic flow in the entrance region of a cylindrical tube is analyzed. Both weak and strong viscous interactions are considered and the differences between internal and external flow with transverse curvature are discussed. For the weak interaction case, only the leading term or inviscid flow is considered. The rotational flow field is determined by a thin-shock-layer method. Comparisons are made with solutions obtained from the equivalence principle as well as with an exact numerical finite-difference integration. In the strong interaction region, the Karman-Polhausen integral method and the tangent-cone approximation are used to describe the boundary-layer flow

and the streamwise pressure variation, respectively. The shock-wave location, the induced pressure field, the heat transfer and the displacement thickness are determined. It is found that transverse curvature leads to an adverse pressure gradient effect for internal flows. (Author)

AD-767 602/6GA PC$3.50/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Aerospace Engineering
ANALYTICAL STUDY OF SUBSONIC LAMINAR BOUNDARY LAYER SEPARATION AND REATTACHMENT INCLUDING VISCOUS-INVISCID INTERACTION,
G. R. Inger, and Birendra Dutt. May 73, 53p Rept no. VPI-E-73-20 AFOSR-TR-73-1686
Grant AF-AFOSR-2173-72

Descriptors: (*Laminar boundary layer, *Subsonic characteristics), Flow separation, Flow fields, Interactions, Mathematical prediction, Secondary flow, Pressure.
Identifiers: *Flow reattachment, Viscous flow, Inviscid flow, Pressure gradients.

An approximate analytical theory is developed for predicting nonsimilar laminar boundary layer flows with separation, reversed flow and reattachment including subsonic viscous-inviscid interation, with application to a separation bubble problem. The analytical approach is based on a triple-deck flow model, the boundary layer being divided into two layers overlaid by a third region of interacting inviscid flow. It is shown that this model has a heretofore unrecognized double-branched solution character that enables it to pass through separation and reattachment without signularities and provide a unified description over a wide range of both attached and reversed flow states. An iterative stream-wise pass method of calculation is devised which is free from the usual Crocco-Lees critical points occurring in interaction problems. Application to a specific example involving a linear adverse pressure gradient yields results in good agreement with an exact Navier-Stokes solution. (Author)

COM-73-11363/1GA Reprint
New York Univ., N.Y. Courant Inst. of Mathematical Sciences.
A NUMERICAL STUDY IN THREE SPACE DIMENSIONS OF BENARD CONVECTION IN A ROTATING FLUID,
Richard C. J. Somerville, and Frank B. Lipps. 10 Oct 72, 10p NOAA-73081711
Contract AT(30-1)-1480
Prepared in cooperation with Lamont-Doherty Geological Observatory, Palisades, N.Y.
Pub. in Jnl. of Atmospheric Sciences, v30 n4 p590-596 May 73.

Descriptors: (*Fluid flow, *Convection), Equations of motion, Vortices, Numerical integration, Coriolis force.
Identifiers: Boussinesq equations, Benard convection.

The primitive, nonlinear, Boussinesq equations of motion, continuity and thermodynamic energy are integrated numerically in three space dimensions and time to study convection driven by unstable vertical density gradients and subject to Coriolis forces. Parameter values are chosen to permit quantitative comparison with data from laboratory experiments for rotating Benard convection in water. The model realistically simulates the structure of the convection cells, their horizontal scale, and the mean vertical heat transport. The experimentally observed phenomenon of a non-monotone dependence of heat transport on rotation rate is reproduced and shown to be a consequence of the rotational constraint on the wavelength of the cells. (Author)

MRR-108/GA PC$6.50/MF$1.45
Technische Universitaet Muenchen, Garching (West Germany). Laboratorium fuer Reaktorregelung und Anlagensicherung.
CALCULATION OF MASS FLOW OF COMPRESSIBLE, FRICTION-BURDENED STREAMS: COMPARISON OF THEORY AND EXPERIMENT.
D. Brosche. Aug 72, 90p
In German. U.S. Sales Only.

Descriptors: (*Two-phase flow, *Mathematical models), (*Compressible flow, Mathematical models), Computers, Containment shells, Friction.

For abstract, see NSA 28 02, number 02507.

NP-19714/GA PC$3.25/MF$1.45
Kungliga Tekniska Hogskolan, Stockholm (Sweden).
INFLUENCE OF THE SURFACE IN HEAT TRANSFER AND PRESSURE DROP FOR WIDE TURBULENT CHANNEL FLOW.
B. Kjellstroem. 1 Feb 67, 22p
In Swedish. U.S. Sales Only.

Descriptors: (*Turbulent flow, *Heat transfer), Pressure gradients, Surfaces.

For abstract, see NSA 28 02, number 05047.

N73-26996/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FORTRAN PROGRAM FOR CALCULATING VELOCITIES AND STREAMLINES ON THE HUB-SHROUD MID-CHANNEL FLOW SURFACE OF AN AXIAL- OR MIXED-FLOW TURBOMACHINE. 1: USER'S MANUAL.
T. Katsanis. Jul 73, 97p NASA-TN-D-7343, E-7154

Descriptors: *Computer programs, *Subsonic flow, *Transonic flow, *Turbomachinery, Flow characteristics, Flow equations, Numerical analysis, Pressure distribution.

For abstract, see STAR 1118

N73-27174/4GA PC$3.00/MF$1.45
Atomic Weapons Research Establishment, Aldermaston (England).
TOPAL: A COMPUTER CODE FOR INVESTIGATING METAL-LIQUID THERMAL INTERACTIONS IN SHOCK-TUBE GEOMETRY. PART 1: THEORETICAL DESCRIPTION.
K. Morgan. Jun 73, 11p GRO/44/91/26-PT-1, TRG-2459-PT-1

Descriptors: *Computer programs, *Liquid-solid interfaces, *Shock tubes, *Thermodynamic properties, Compressible flow, Equations of motion, Unsteady flow.

For abstract, see STAR 1118

N73-27208/0GA PC$2.45/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
TABLES FOR SUPERSONIC FLOW OF HELIUM AROUND RIGHT CIRCULAR CONES AT ZERO ANGLE OF ATTACK.
J. L. Sims. 1973, 28p NASA-SP-3078, LC-73-600000

Descriptors: *Conical bodies, *Fluid flow, *Helium, *Hypersonic flow, *Supersonic flow, Data processing, Flow characteristics, Flow equations, Tables (Data).

For abstract, see STAR 1118

N73-27209/8GA PC$3.75/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
CALCULATION OF POTENTIAL FLOW AROUND PROFILES WITH SUCTION AND BLOWING.
K. Jacob. Jul 73, 34p NASA-TT-F-14962
Contract NASW-2481
Tran-Transl. Into English from Ing.-Arch. (Berlin), V. 32, No. 1, 1963 p 51-65.

Descriptors: *Aerodynamic configurations, *Blowing, *Integral equations, *Potential flow, *Suction, Flow distribution, Incompressible flow, Linear equations, Pressure distribution.

For abstract, see STAR 1118

N73-27210/6GA PC$5.75/MF$1.45
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
SOLUTION OF NON-ISOENERGETIC SUPERSONIC FLOWS BY METHOD OF CHARACTERISTICS, VOLUME 3.
Final Report.
R. J. Prozan. Jan 72, 74p NASA-CR-132274, HREC-7761-3-REV-A
Contract NAS7-761

Descriptors: *Flow distribution, *Method of characteristics, *Supersonic flow, Computer programs, Equations of motion.

For abstract, see STAR 1118

N73-27211/4GA PC$9.75/MF$1.45
Grumman Aerospace Corp., Bethpage, N.Y.
DEVELOPMENT OF ANALYTICAL METHODS OF PREDICTING THE PRESSURE DISTRIBUTION ABOUT A NACELLE AT TRANSONIC SPEEDS: EXACT SOLUTION.
Final Report.
B. Grossman, and G. Moretti. Jul 73, 153p NASA-CR-112271
Contract NAS1-10803

Descriptors: *Computer programs, *Flow distribution, *Nacelles, *Numerical analysis, Euler equations of motion, Problem solving, Transonic flow.

For abstract, see STAR 1118

N73-27213/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FREE TURBULENT SHEAR FLOWS. VOLUME 2: SUMMARY OF DATA.
S. F. Birch. 1973, 94p NASA-SP-321
Conf-Conf. Held at Hampton, VA., 20-21 Jul. 1972.

Descriptors: *Flow characteristics, *Shear flow, *Shear layers, *Turbulent flow, Data acquisition, Flow equations, Jet mixing flow.

For abstract, see STAR 1118

N73-27215/5GA PC$7.75/MF$1.45
Pratt and Whitney Aircraft, East Hartford, Conn.
APPLICATION OF HOLOGRAPHY TO THE DETERMINATION OF FLOW CONDITIONS WITHIN THE ROTATING BLADE ROW OF A COMPRESSOR.
R. G. Hantman, R. J. Burr, W. G. Alwang, and M. C. Williams. Jul 73, 114p NASA-CR-121112, PWA-4712
Contract NAS3-15340

Descriptors: *Compressor rotors, *Flow distribution, *Flow visualization, *Holography, Rotating bodies, Shock waves, Transonic flow.

For abstract, see STAR 1118

N73-27216/3GA PC$3.00/MF$1.45
California Univ., Santa Barbara.

LASER DOPPLER VELOCITY MEASUREMENTS OF SWIRLING FLOWS WITH UPSTREAM INFLUENCE.
K. L. Rloff, and H. H. Bossel. Jul 73, 44p NASA-CR-2284
Contract NGR-05-010-025

Descriptors: *Flow distribution, *Flow measurement, *Flow visualization, *Swirling, Anemometers, Flow characteristics, Flow equations, Lasers, Test equipment.

For abstract, see STAR 1118

N73-27806/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HEAT TRANSFER CHARACTERISTICS OF A SINGLE CIRCULAR AIR JET IMPINGING ON A CONCAVE HEMISPHERICAL SHELL.
J. N. B. Livingood, and J. W. Gauntner. Aug 73, 16p NASA-TM-X-2859, E-7462

Descriptors: *Air flow, *Cylindrical shells, *Heat transfer, *Jet impingement, *Turbulent flow, Flow characteristics, Hemispheres, Thermodynamic properties.

For abstract, see STAR 1118

N73-27866/5GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE RESTORATION OF OBLITERATED STAMPED SERIAL NUMBERS BY ULTRASONICALLY INDUCED CAVITATION IN WATER.
S. G. Young. 1973, 22p NASA-TM-X-68257, E-7534
Conf-Proposed for Presentation at 29TH Seminann. Seminar on the Calif. Assoc. Of Criminalists, Palo Alto, Calif., 17-19 Oct. 1973.

Descriptors: *Cavitation flow , *Piezoelectric transducers, *Ultrasonic radiation, *Water, Low cost, Metals, Numbers.

For abstract, see STAR 1118

N73-28154/5GA PC$9.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FREE TURBULENT SHEAR FLOWS. VOLUME I: CONFERENCE PROCEEDINGS.
1973, 763p NASA-SP-321
Conf-Conf. Held at Hampton, VA., 20-21 Jul. 1972.

Descriptors: *Conferences, *Mathematical models, *Shear flow, *Turbulent flow, Eddy viscosity, Free flow, Jet mixing flow, Prandtl number, Shear layers, Transport theory, Turbulent mixing.

For abstract, see STAR 1119

N73-28178/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RETRIEVAL OF DISPERSIVE AND CONVECTIVE TRANSPORT PHENOMENA IN FLUIDS USING STATIONARY AND NONSTATIONARY TIME DOMAIN ANALYSIS.
J. B. Stephens, and R. M. St.John. Aug 73, 104p NASA-TN-D-7240, M-106-REV
Misc-Revised.

Descriptors: *Convective flow, *Fluid flow, *Statistical correlation, *Transport properties, Fourier analysis, Glow discharges, Time measurement.

For abstract, see STAR 1119

N73-28184/2GA PC$6.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany).
STABILITY OF HAGEN-POISEUILLE FLOWS WITH SUPERPOSED RIGID ROTATION STABILITAET VON HAGEN-POISEUILLE-STROEMUNGEN MIT UEBERLAGERTER STARRER ROTATION.
P. Mackrodt. 1971, 76p MITT-55
Language in German.

Descriptors: *Flow stability, *Laminar flow, *Pipe flow, *Rotating fluids, *Small perturbation flow, Computer programming, Differential equations, Navier-stokes equation, Three dimensional flow, Turbulence.

For abstract, see STAR 1119

N73-28922/5GA PC$6.50/MF$1.45
Wyle Labs., Inc., Huntsville, Ala.
PREDICTION OF FLUCTUATING PRESSURE ENVIRONMENTS ASSOCIATED WITH PLUME-INDUCED SEPARATED FLOW FIELDS.
K. J. Plotkin. May 73, 87p NASA-CR-124346, WR-73-3
Contract NAS8-26919

Descriptors: *Flow characteristics, *Pressure distribution, *Pressure gradients, *Rocket exhaust, Numerical analysis, Shock waves, Wave propagation.

For abstract, see STAR 1119

N73-28933/2GA PC$9.25/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
CONTINUING STUDIES IN AERODYNAMICS, LARGE WIND TUNNELS, ENERGETICS, PHYSICS, AND MATERIALS.
1972 Activities.
1972, 144p

Descriptors: *Aerospace engineering, *Research projects, Aerodynamics, Cost analysis, France, Management planning, Patents, Research management, Wind tunnels.

For abstract, see STAR 1119

PAT-APPL-385522/GA PC$3.25/MF$1.45
Martin Marietta Corp., Denver, Colo.
FILTER REGENERATION SYSTEMS.
Patent Application.
V. A. Descamp, M. W. Boex, M. W. Hussey, and T. P. Larson. Filed 3 Aug 73, 21p NASA-CASE-MSC-14273-1,
Contract NAS9-11984
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fluid filters, *Fluid flow, *Hydraulic equipment, Equipment specifications, Patent applications, Spacecraft components.

A system for regenerating a fluid filter where the filter normally retains particulate matter entrained in the fluid flow is described. The construction and operation of the equipment are discussed. The invention was directed toward a spacecraft fluid system design and filter maintenance techniques for possible in-flight maintenance on space shuttles. The invention is unique through the jet impingement action during the back flushing cycle.

PATENT-3 744 305/GA Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS AND METHOD FOR GENERATING LARGE MASS FLOW OF HIGH TEMPERATURE AIR AT HYPERSONIC SPEEDS.
Patent.
A. P. Sabol, and R. B. Stewart. Patented 10 Jul 73, 5p NASA-CASE-LAR-10612-1,
Misc-Filed 9 Mar. 1972 Supersedes N72-25307 (10 - 16, p 2140).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Air flow, *High temperature air, *Hypersonic speed, Arc heating, Hypersonic nozzles, Patents, Pressurizing, Storage tanks.

High temperature, high mass air flow and a high Reynolds number test air flow in the Mach number 8-10 regime of adequate test flow duration is attained by pressurizing a ceramic-lined storage tank with air to a pressure of about 100 to 200 atmospheres. The air is heated to temperatures of 7,000 to 8,000 R prior to introduction into the tank by passing the air over an electric arc heater means. The air cools to 5,500 to 6,000 R while in the tank. A decomposable gas such as nitrous oxide or a combustible gas such as propane is injected into the tank after pressurization and the heated pressurized air in the tank is rapidly released through a Mach number 8-10 nozzle. The injected gas medium upon contact with the heated pressurized air effects an exothermic reaction which maintains the pressure and temperature of the pressurized air during the rapid release.

SC-DC-721743/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SIMPLIFIED DYNAMIC MODEL OF PARACHUTE INFLATION.
D. Wolf. 1973, 16p CONF-730523-1

Descriptors: Aerodynamics, Configuration, Functional models, Textiles.

For abstract, see NSA 28 03, number 07776.

SC-RR-72-449/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
VISCOUS SHOCK-LAYER FLOW IN THE WINDWARD PLANE OF CONES AT ANGLE OF ATTACK.
R. R. Eaton, and P. C. Kaestner. Mar 72, 66p

Descriptors: (*Fluid flow, *Cones), (*Shock waves, Fluid flow), Differential equations, Mach number, Navier-stokes equation, Reynolds number, V codes.

For abstract, see NSA 28 03, number 07777.

SC-RR-72-826/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
INVESTIGATION OF THE RELATION BETWEEN THE TURBULENT ENERGY SPECTRUM AND THE ENERGY TRANSFER FUNCTION FOR ISOTROPIC FLUIDS.
R. L. Fox. Mar 72, 21p

Descriptors: (*Fluid flow, *Turbulence), Energy spectra, Energy transfer, Interactions, Three-dimensional calculations.

For abstract, see NSA 28 03, number 07778.

SCL-DC-720375/GA PC$4.00/MF$1.45
Sandia Labs., Livermore, Calif.
CENTERLINE VELOCITY DECAY OF COMPRESSIBLE FREE JETS USING A NEW CORRELATION FOR THE EDDY VISCOSITY.
P. O. Witze. Apr 73, 38p
Contract AT(29-1)-789

Descriptors: (*Jets, *Viscosity), Boundary layers, Compressible flow, Gas flow, Subsonic flow, Supersonic flow, Velocity.

For abstract, see NSA 28 03, number 07779.

SGAE-2034/GA PC$4.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Physik-Institut.
DYNAMICS OF SIMPLE FLUIDS.
O. J. Eder. Sep 72, 27p CONF-720969-1
In German. U.S. Sales Only.

Descriptors: Atoms, Correlations, Fluid flow, Kinetics, Mathematical models.

For abstract, see NSA 28 02, number 05067.

SLA-73-366/GA PC$7.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
THREE-DIMENSIONAL, INCOMPRESSIBLE BOUNDARY LAYER ON BLUNT BODIES. PART I. ANALYSIS AND RESULTS.
F. G. Blottner, and M. Ellis. Apr 73, 99p

Descriptors: (*Incompressible flow, *Boundary layers), Laminar flow, Three-dimensional calculations.

For abstract, see NSA 28 03, number 07786.

20E. Masers and Lasers

AD-767 049/0GA PC$3.50/MF$1.45
Owens-Illinois Inc Toledo Ohio Corporate Technology Div
DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
Semiannual technical rept. 1 Jan-30 Jun 73,
N. L. Boling, and George Dube. 30 Jun 73, 63p
Contract DAHC15-72-C-0170
See also report dated 31 Jan 73, AD-755 134.

Descriptors: (*Lasers, Optical glass), (*Optical glass, Radiation damage), Optical coatings, Dielectrics, Plasma medium, Polishes, Coherent radiation, Thermal radiation, Light pulses.
Identifiers: *Laser materials, Q switched lasers, *Neodymium glass lasers, Laser produced plasmas, Self focusing, Laser beams.

Results of studies of Q-switched laser damage to transparent uncoated dielectric surfaces are presented. Some findings are also applicable to damage of optical coatings. Studies of damage morphology and threshold for several different glasses show that a bright plasma does not invariably accompany surface damage. Consequently, studies of surface damage that are based on the appearance of a visible plasma may lead to incorrect inferences regarding thresholds and mechanisms. The morphology of aplasmic damage, along with other evidence, strongly suggests that this damage is caused by absorption by submicron inclusion near the surface, and not electron avalanche. Polishing compound and process can be major factors determining damage threshold. Elimination of scratches from the surface is not a sufficient condition for raising the threshold. Construction of a high energy density laser operating at 30 ns is also described. (Author)

AD-767 093/8GA Reprint
Arizona Univ Tucson Dept of Physics
LASER-PHASE TRANSITION ANALOGY. II,
J. C. Goldstein, M. O. Scully, and P. A. Lee. 10 May 71, 6p AFOSR-TR-73-1613
Grant AF-AFOSR-1921-70
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Dept. of Physics, and Yale Univ., New Haven. Dept. of Physics. See also AD-729 468.

Descriptors: (*Lasers, Phase studies), (*Ferromagnetism, Correlation techniques), Magnetic moments, Statistical functions.
Identifiers: Ising ferromagnets, Phase transformations.

A dynamical theory of an Ising ferromagnet coupled to a thermal reservoir is presented. Beginning with microscopic, reversible Hamiltonian dynamics, the research proceeds to an irreversible equation of motion for the magnetization probability density P(m,t), in analogy with the laser analysis. (Modified author abstract)

AD-767 100/1GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
EMISSION CHARACTERISTICS OF A TUBE-SHAPED LASER OSCILLATOR,
David Milam, and Howard Schlossberg. 2 Jan 73, 4p Rept no. AFCRL-TR-73-0577
Availability: Pub. in Jnl. of Applied Physics, v44 n5 p2297-2299 May 73.

Descriptors: (*Lasers, Light pulses), Radiation damage, Coherent radiation, Focusing.
Identifiers: Neodymium glass lasers, Thermal lens effect.

Long-pulse emissions characteristics of an oscillator which uses a thin-walled tube of Nd : glass as the lasing medium are described. Slope efficiency in the single-shot mode was 0.9%, with 70% of the energy being contained in a full divergence angle of 1.7 mrad. Single-shot characteristics were maintained at repetition rates up to 0.2 pps in close agreement with the calculated thermal time constant. Peak output of 4.1 times the single-shot value was obtained at 2-3 pps. (Author)

AD-767 167/0GA Reprint
Washington Univ St Louis Mo Dept of Physics
SURVEY OF THE PRESENT STATUS OF NEOCLASSICAL RADIATION THEORY,
E. T. Jaynes. 1973, 49p AFOSR-TR-73-1610
Contract F44620-69-C-0121
Availability: Pub. in Coherence and Quantum Optics, p35-81 1973.

Descriptors: (*Lasers, *Quantum mechanics), (*Masers, Quantum mechanics), Field theory, Coherent radiation, Quantum statistics, Electromagnetic fields, Atomic energy levels.
Identifiers: *Quantum electrodynamics, Superradiance, Spontaneous emission.

Present quantum electrodynamics (QED) contains many very important 'elements of truth', but also some clear 'elements of nonsence'. Because of the divergences and ambiguities, there is general agreement that a rather deep modification of the theory is needed, but in some forty years of theoretical work, nobody has seen how to disentangle the truth from the nonsense. In such a situation, one needs more experimental evidence, but during that same forty years no clues from the laboratory as to what specific features of QED might be modified have been found. Even worse, in the absence of any alternative theory whose predictions differ from those of QED in known ways, there is no criterion telling which experiments would be the relevant ones to try.

AD-767 190/2GA PC$4.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
PERFORMANCE OF TRIPLE SLIT NOZZLE FOR CHEMICAL LASER APPLICATIONS.
Rept. for Sep 71-Mar 72,
Donald A. Durran, and Robert L. Varwig. 28 Sep 73, 39p Rept no. TR-0074(4240-10)-2 SAMSO-TR-72-296
Contract F04701-73-C-0074

Descriptors: (*Gas lasers, Supersonic nozzles), Design, Supersonic flow, Performance(Engineering).
Identifiers: *Chemical lasers, *Hydrogen fluoride lasers.

A triple slit nozzle was constructed for use on a continuous, diffusion-type, HF chemical laser. In this nozzle, a primary supersonic stream of He, F, and F2 is separated from the H2 stream by a buffer stream of He. When the primary stream contains large amounts of F2, either because the dissociation level is down or because there is less diluent, the buffer stream serves to reduce the severity of the reaction between F2 and H2 near the nozzle exit plane. The results of measurements of the flow properties of the triple slit nozzle and its use in an SF6 laser are discussed in this report. (Author)

AD-767 192/8GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
EXPERIMENTAL CW CHEMICAL LASER STUDIES.
Rept. for Jul 70-Jun 71,
Donald J. Spencer, and Robert L. Varwig. 15 Sep 73, 47p Rept no. TR-0074(4240-10)-3 SAMSO-TR-73-295
Contract F04701-73-C-0074

Descriptors: (*Gas lasers, Nozzle gas flow), Chemical reactions, Reaction kinetics, Flow fields, Turbulence, Shock waves, Pressure.
Identifiers: *Chemical lasers, Continuous wave lasers, *Hydrogen fluoride lasers.

Experimental studies of The Aerospace Corporation's continuously operating diffusion-type HF chemical lasers are presented. Nonuniform flow profiles at the laser nozzle exit are deducted by the use of pitot and total-temperature probes. The presence of shock waves and the measured flow profiles were of particular interest in the explanation of laser performance under varied flow conditions. Low-diluent-ratio flows resulted in a deterioration of laser performance partly because of thermal blockage effects. Alternate nozzles were plugged in order to provide lateral jet expansion relief, which resulted in improved laser performance. Pressure scaling was investigated up to approximately 5 atm plenum pressure and 16-Torr cavity pressure. For fixed plenum conditions, an increase in cavity pressure resulted in a decrease in laser power and axial lasing length (due to oblique shocks and nozzle separation). For fixed cavity pressure, an increase in plenum pressure resulted in an increase in power and axial lasing length (due to a reduced boundary layer). The cavity pressure for peak power corresponded quite closely to the cavity pressure predicted for matched nozzle flow. (Author)

AD-767 194/4GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
A SIMPLE MODEL OF A LINE SELECTED, LONG CHAIN, PULSED DF-CO2 CHEMICAL TRANSFER LASER.
Rept. of 1 Apr-30 Jun 72,
Ronald L. Kerber. 25 Jul 73, 43p Rept no. TR-0074(4640)-3 SAMSO-TR-73-298
Contract F04701-73-C-0074

Descriptors: (*Gas lasers, Mathematical models), Chemical reactions, Reaction kinetics, Irasers, Tables.
Identifiers: *Chemical lasers, *Carbon dioxide lasers, *Deuterium fluoride lasers, Pulsed lasers.

A rate equation model of a pulsed DF-CO2 chemical transfer laser is simplified by investigating the relationship of kinetic mechanisms. The model reduces to one equation which when solved permits calculation of all pulse characteristics as a function of time. At low levels of initiation, predictions of this laser simulation model are in excellent agreement with those of a more comprehensive model presented in an earlier paper. Model predictions are also found to be consistent with experiment. The simplicity of the present model lends itself to easy physical interpretation and permits efficient and accurate prediction of transfer laser performance characteristics in regimes of practical interest. (Author)

AD-767 281/9GA PC$4.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass

GENERATION, SELECTION AND AMPLIFICATION OF MODE-LOCKED RUBY LASER PULSES,
David Milam, R. A. Bradbury, E. S. Bliss, and C. C. Gallagher. 29 Aug 73, 39p Rept no. AFCRL-TR-73-0550

Descriptors: (*Lasers, Design), Light pulses, Optical equipment components, Performance(Engineering).
Identifiers: *Ruby lasers, Mode locked lasers, Laser beams.

A system capable of producing laser pulses of 5-20 picosecond duration and with energies of up to 40 mJ is described. The system consists of a TEM(oo)-mode, mode-locked ruby laser, an external pulse selector, and two amplifiers. TEM(oo)-mode operation is obtained in the passively mode-locked oscillator by the use of a ruby rod only 2.5 mm in diameter so that the rod is the limiting aperture of the cavity. The total pulse trains have energies of about 3 mJ, while individual pulses have energies of 0.2 to 0.3 mJ and are 20 to 25 psec in duration. The pulse duration can be reduced to approximately 5 psec by incorporating a telescope in the cavity. The probability of obtaining a cleanly locked pulse train exceeds 0.8 and intracavity damage is minimized due to the smooth mode profile. (Modified author abstract)

AD-767 316/3GA PC$3.50/MF$1.45
University of Southern California Los Angeles Electronic Sciences Lab
IR WINDOW STUDIES.
Quarterly technical rept. no. 3,
Ferdinand Kroger, and John H. Marburger. 15 Mar 73, 62p Rept no. USCEE-454 AFCRL-TR-73-0054
Contract F19628-72-C-0275, ARPA Order-2055

Descriptors: (*Infrared windows, Infrared optical materials), (*Irasers, Infrared windows), Crystal growth, Gallium arsenides, Single crystals, Impurities, Defects(Materials), Sodium chloride, Potassium compounds, Cadmium compounds, Tellurides, Gas lasers, Optical properties, Thermal stresses.
Identifiers: Potassium chlorides, Cadmium tellurides, Carbon dioxide lasers.

During this quarter, additional wavelength dependent calorimetric measurements of IR absorption in very pure GaAs have been made which indicate that a lower level of absorption coefficient is being reached for GaAs grown from the high temperature melt by conventional techniques. Experiments on strain annealing and purification of GaAs have been carried out in an effort to modify its absorption characteristics. The stress-strain properties of GaAs are under continuing investigation. The ultra pure Alkali Halide production facility is now in operation and producing KCl powder as well as single crystals. A new technique for measuring surface absorption has been devised, and preliminary feasibility experiments completed. An important class of sum rules for the frequency moments of the multiphonon contribution to absorption coefficients has been discovered. Progress in other areas of IR window material preparation, characterization and growth is reported. (Author)

AD-767 415/3GA PC$3.50/MF$1.45
United Aircraft Research Labs East Hartford Conn
ULTRA-WIDEBAND THIN FILM MODULATORS FOR CO2 LASERS.
Semi-annual technical rept. 25 Mar-25 Sep 73,
P. K. Cheo, M. Gilden, J. F. Black, and J. L. Swindal. 30 Sep 73, 59p Rept no. UARL-M921513-4
Contract N00014-73-C-0087, ARPA Order-1860
See also report dated Mar 73, AD-757 792.

Descriptors: (*Gas lasers, Modulators), (*Irasers, Modulators), Semiconducting films, Gallium arsenides, Electrooptics, Phase modulation, Microwave equipment, Waveguides, Opdar, Light communication systems.
Identifiers: *Carbon dioxide lasers, Optical modulators, Laser modulators, Thin films, Optical waveguides.

The long range objective of this program is to develop an efficient and practical ultra-wideband thin film modulator for CO2 lasers useful for optical image radars and high-data-rate optical communication systems. During the present contracting period (25 May 1973 to 25 December 1973), the goal of this program is aimed at the demonstration of efficient sideband generation of a 10.6 micrometer CO2 laser carrier at microwave frequencies (X-band) in a nonlinear GaAs thin film optical modulator element which is interfaced with a microwave ridge guide structure. Electrooptic interaction in a GaAs thin film between an optical guided-wave and either a traveling or a synchronous standing microwave signal can produce a sideband at the sum and difference frequencies. By using a frequency modulated microwave field, a chirped optical signal in the sideband is generated. This signal can be separated from others by a proper optical filtering technique such as a diffraction grating or a narrow bandpass interferometer.

AD-767 427/8GA PC$3.00/MF$1.45
United Aircraft Research Labs East Hartford Conn
PICOSECOND LASER PULSES.
Semi-Annual technical rept. 1 Mar-31 Aug 73,
William H. Glenn. 30 Sep 73, 44p Rept no. UARL-M920479-42
Contract N00014-66-C-0344, ARPA Order-1806
See also AD-758 059.

Descriptors: (*Lasers, Light pulses), (*Opdar, Resolution), Synthetic aperture radar, Radar images, Doppler effect, Mathematical models, Fourier analysis.
Identifiers: Image processing, Signal processing, Fourier series.

The report reviews briefly the application of ultrashort pulses to imaging radars, and shows the need for an alternate signal processing scheme. A mathematical description and physical interpretation of frequency domain sampling is presented and its application to time scaling and matched filtering is discussed. An experiment to demonstrate the technique is outlined and will be carried out during the next reporting period.

AD-767 494/8GA Reprint
Arizona Univ Tucson Dept of Physics
THEORY OF LASER OPERATION. AN OUTLINE, (A2),
M. Sargent, III, and M. O. Scully. 1972, 72p
AFOSR-TR-73-1655
Grant AF-AFOSR-1921-70
Availability: Pub. in Laser Handbook, p45-114 1972 (North Holland Pub. Co., Amsterdam).

Descriptors: (*Lasers, Theory), Gas lasers, Operation, Quantum mechanics, Quantum statistics, Blackbody radiation, Dipole moments, Polarization, Atomic energy levels, Electron transitions, Zeeman effect, Photons.
Identifiers: Mode locked lasers, Ring lasers, Zeeman lasers.

An outline of laser theory is given where the atoms, formally described by a density matrix, obey the laws of quantum mechanics whereas the electromagnetic field is first treated classically. This theory is used to discuss the threshold condition, gain saturation, mode pulling, the rate-equation approximation, multi-mode operation including two-mode competition and three-mode competition and three mode locking, the Lamb dip and hole burning, and the analogy between ring and Zeeman lasers. In the second form of laser theory, the electromagnetic field also obeys quantum laws. This theory accounts for laser linewidth, the field build-up from spontaneous emission, and photon and photo-electron counting statistics. The analogy between laser threshold and second-order phase transitions is discussed. (Author)

AD-767 495/5GA Reprint
Arizona Univ Tucson Dept of Physics
THE LASER-PHASE TRANSITION ANALOGY-RECENT DEVELOPMENTS,
Marlan O. Scully. 1973, 14p AFOSR-TR-73-1666
Grant AF-AFOSR-1921-70
Availability: Pub. in Coherence and Quantum Optics, p691-702 1973. (Plenum Pub., Corp., N. Y.).

Descriptors: (*Lasers, Theory), Ferromagnetism, Phase studies, Field theory, Superfluidity, Superconductors.
Identifiers: Analogies.

The behavior of a laser near threshold has a close formal analogy to the behavior near their critical temperatures of certain physical systems such as ferromagnets, superfluids and superconductors which undergo phase transitions. Analysis of this analogy shows that the laser population inversion plays the role of temperature and that the electric field acts as an order parameter. An injected classical signal serves as a symmetry breaking mechanism for the laser, in much the same way as an external magnetic field serves as a symmetry breaking mechanism for a ferromagnet. (Author)

AD-767 611/7GA PC$4.50/MF$1.45
Washington Univ Seattle Dept of Aeronautics and Astronautics
DEVELOPMENTS IN HIGH POWER LASER RESEARCH.
Final rept.,
A. Hertzberg. Jun 73, 133p* AFOSR-TR-73-1690
Grant AF-AFOSR-1925-70

Descriptors: (*Lasers, Scientific research), Gas lasers, Nozzle gas flow, Reaction kinetics, Shock tubes, Energy conversion, Thermonuclear reactions.
Identifiers: Chemical lasers, Carbon dioxide lasers, Laser heating.

The effects of high-power laser technology programs on basic research activities in this country and abroad are described and analyzed. The particularly multidisciplinary nature of laser research which has had a special impact on physicists, fluid dynamicists and researchers in other branches of engineering science is highlighted. Also included to indicate the universal interest in the problem areas is the program of the Esfahan Symposium on Fundamental Laser Physics, held in Tehran, Iran late in August 1971 at which Russia, Poland, Austria, Italy, Israel, Japan, Canada as well as the U.S. presented papers. Future directions for research are described and inhibiting factors on achieving the desired plateau of knowledge from which developments should proceed are outlined. (Author)

COM-73-50779/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A STUDY OF THE CW 28-MICROMETER WATER-VAPOR LASER.
Final rept.,
Earl R. Mosburg, Jr. 1973, 9p
Contract ARPA Order-891
Pub. in IEEE Jnl. of Quantum Electronics, QE-9, n8 p843-851 Aug 73.

Descriptors: (*Gas lasers, Water vapor), (*Infrared lasers, Water vapor), Gas discharges, Excitation, Electron transitions, Amplification.
Identifiers: *Water vapor lasers, Continuous wave lasers, Gain.

The low signal gain of a cw water-vapor laser at 28 micrometers was measured as a function of the discharge current and pressure. Together with the measurement of other quantities such as the axial electric field and the concentration of OH, a partial interpretation of the mechanisms involved in pumping the 28 micrometers transition was possible. Thermal equilibrium between the nu(0), 2nu(2) and nu(3) vibrational levels will result in a large absorption at the elevated gas temperatures observed (800 to 1000K). The strong dependence of gain on

the electron temperature strongly suggests that the vibrational excitation proceeds through electron impact excitation. Only the electron-impact excitation of H2O is quantitatively capable of overcoming the large thermally induced absorption. Although vibrational-excitation transfer from H2 to H2O seems insufficient, by itself, to overcome this absorption, it may provide appreciable additional gain. Pumping of the 28 micrometer line through electron-ion recombination and by reactions involving OH can be ruled out.

LA-UR-73-69/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
GENERATION OF SINGLE NANOSECOND PULSES AT 10.6 MU USING A BREWSTER-ANGLE ACOUSTO-OPTIC MODULATOR.
J. F. Figueira, S. Singer, and E. Foley. 1973, 5p
CONF-730515-1

Descriptors: (*Laser radiation, *Modulation), Carbon dioxide, Pulses, Spark gaps, Switches.

For abstract, see NSA 28 03, number 07734.

LA-5154-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
ELECTRON TRANSPORT IN GAS DISCHARGE LASERS.
D. B. Henderson. Apr 73, 10p
Contract W-7405-eng-36

Descriptors: (*Lasers, *Electrons), Transport theory.

For abstract, see NSA 28 02, number 05042.

N73-27433/4GA PC$3.00/MF$1.45
Lausanne Univ. (Switzerland).
AN ABSOLUTE CALORIMETER FOR HIGH POWER CARBON DIOXIDE LASER.
P. Boulanger, A. Heym, J. Mayor, and Z. A. Pietrzyk. Jan 73, 10p LRP-59/73
Subm-Sponsored by the Swiss Natl. Sci. Found.

Descriptors: *Calorimeters, *Carbon dioxide lasers, *Laser outputs, Copper, Infrared lasers, Polymethyl methacrylate, Thermocouples.

For abstract, see STAR 1118

N73-27434/2GA PC$3.50/MF$1.45
Lausanne Univ. (Switzerland). Centre de Recherches en Physique des Plasmas.
A DOUBLE DISCHARGE HIGH POWER TEA CO2 LASER.
P. Boulanger, A. Heym, J. Mayor, and Z. A. Pietrzyk. Feb 73, 29p LRP-60/73

Descriptors: *Arc discharges, *Carbon dioxide lasers, *Xylene, Gas mixtures, Glow discharges, Plasma diagnostics, Polarized light, Pulsed lasers.

For abstract, see STAR 1118

N73-28554/6GA PC$4.00/MF$1.45
California Univ., Los Angeles. School of Engineering and Applied Science.
THE APPLICATION OF FAR IR LASERS TO THE INVESTIGATION OF THE OPTICAL PROPERTIES OF MATERIALS.
Final Report.
O. M. Stafsudd. May 73, 38p NASA-CR-132769, UCLA-ENG-7338
Contract NGL-05-007-161

Descriptors: *Absorption, *Infrared lasers, *Molecular gases, *Saturation, Diffusion, Mathematical models, Pressure effects.

For abstract, see STAR 1119

PAT-APPL-374423/GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ACOUSTICALLY CONTROLLED DISTRIBUTED FEEDBACK LASER.
Patent Application.
C. Elachi. Filed 28 Jun 73, 16p NASA-CASE-NPO-13175-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Frequency control, *Laser modes, *Laser outputs, *Lasers, Coherent radiation, Equipment specifications, Patent applications.

An acoustically controlled distributed feedback laser is described. The laser is capable of being readily tuned over a continuous frequency spectrum, scanned, and/or redirected by controlling an acoustic source. The invention also involves continuous as well as pulsed modes of laser operation.

PATENT-3 687 558/GA Not available NTIS
Department of the Air Force Washington D C
LASER POWER-ENERGY METER.
Patent,
George A. Rex. Filed 16 Jul 71, patented 29 Aug 72, 6p Rept nos. PAT-APPL-163 204,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Power meters, *Patents), (*Coherent radiation, Power meters), (*Lasers, Safety).
Identifiers: PAT-CL-356-218, *Laser safety, Laser beams, Power measurement, Continuous wave lasers, Pulsed lasers.

The patent describes a laser power-energy meter which includes a photo-diode acting as a current generator whose output is directly proportional to the optical power incident upon it. The meter provides a direct measurement of optical energy on a per pulse basis on single or repetitive laser pulses by measuring each pulse individually and storing and displaying the energy of the largest received. It also provides a measurement of the power of CW lasers. The measurements are in terms of amount of energy which would enter the human eye. The meter is battery operated and portable.

PATENT-3 688 215/GA Not available NTIS
Department of the Air Force Washington D C
CONTINUOUS-WAVE CHEMICAL LASER.
Patent,
Donald J. Spencer, Harold Mirels, Theodore A. Jacobs, and Rolf W. F. Gross. Filed 21 Sep 70, patented 29 Aug 72, 8p Rept nos. PAT-APPL-73 820,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Gas lasers, *Patents), Irasers, Nozzle gas flow, Supersonic nozzles.
Identifiers: PAT-CL-331-94-5, *Chemical lasers, Continuous wave lasers, Hydrogen fluoride lasers.

The patent discloses a system for generating a continuous wave (CW) chemically pumped lasing action. A continuous radiation output is achieved by a technique which involves generation of a high speed jet containing a reactant and an inert diluent. A second reactant is diffused into the high speed jet. The chemical reaction between these reactants creates, directly, a vibrationally excited gaseous product with the requisite population inversion and lifetime needed for lasing. The vibrationally excited product gas is created within, or flows into, an optical cavity whose axis is transverse to the flow. Lasing is made to occur within the optical cavity. After lasing, the product gas is quickly convected out of the optical cavity by the high speed jet.

PATENT-3 701 048/GA Not available NTIS
Office of the Secretary of the Army Washington D C
MULTI-ROD SINGLE PUMP SOURCE LASER.
Patent,
Walter B. Jennings, Jr. Filed 15 Sep 67, patented 24 Oct 72, 4p Rept nos. PAT-APPL-668 246,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Lasers, *Patents), Pumping(Optical), Multiple operation.
Identifiers: PAT-CL-331-94-5.

The patent describes a device for achieving laser output at a high repetition frequency wherein a plurality of laser rods are pumped by a singular source and the output beams of the laser rods are directed in substantially the same path.

PATENT-3 706 050/GA Not available NTIS
Office of the Secretary of the Army Washington D C
MAGNETOHYDRODYNAMIC GAS DYNAMIC LASER.
Patent,
Charles M. Cason, III. Filed 2 Nov 71, patented 12 Dec 72, 8p Rept nos. PAT-APPL-194 961,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Gas lasers, *Patents), Nozzle gas flow, Magnetohydrodynamics.
Identifiers: PAT-CL-331-94-5, Pulsed lasers.

The patent describes a pulsed gas laser which uses continuously expanding gases that pass through the lasing chamber and subsequently generate a direct current, pulsed electric output which is fed back to stimulate laser emission. A conventional gas burner and nozzle assembly couple flowing gases into a standard laser cavity. Gases leaving the laser cavity pass between poles of an MHD magnet, generating output electric power which is transformed into high voltage pulses of output power. An alkali metal component is introduced into the system before the flowing gases reach the MHD magnet for increasing electrical conductivity of the gas therein and thereby enhancing large pulses of electrical energy feedback for stimulating additional laser action.

20F. Optics

AD-767 101/9GA Reprint
Cornell Univ Ithaca N Y Materials Science Center
RESONANT SECOND-HARMONIC GENERATION IN THE EXCITON REGION OF CUCL AND ZNO.
Technical rept.,
D. C. Haueisen, and H. Mahr. 10 Jan 73, 10p Rept nos. MSC-1925, TR-15
Contract N00014-67-A-0119, Grant NSF-GH-33637
Availability: Pub. in Physical Review B, v8 n2 p734-745, 15 Jul 73.

Descriptors: (*Zinc compounds, Optical properties), (*Copper compounds, Optical properties), Oxides, Chlorides, Excitons, Coherent radiation, Light transmission, Harmonic analysis.
Identifiers: Second harmonic generation, *Zinc oxides, *Copper chlorides, Nonlinear optics, Organic dye lasers, Tunable lasers, Ruby lasers.

Using a pulsed tunable dye laser pumped by a Q-switched ruby laser, the frequency dependence of second-harmonic generation has been measured in the region of the first and second ls excitons of CuCl from about 3.18 to 3.34 eV and the region of the C exciton of ZnO from about 3.38 to 3.48 eV. From the data, the frequency dependence of the optical nonlinear susceptibility has been determined using linear optical constants calculated by a Kramers-Kronig analysis of reflectivity. The results for the single nonzero term of the nonlinear

susceptibility of CuCl and the two terms d(zzz) and d(zxx) of ZnO have been fit theoretically by an anharmonic-oscillator model employing two oscillators. (Author)

AD-767 146/4GA Reprint
Catholic Univ of America Washington D C Vitreous State Lab
EQUILIBRIUM COMPRESSIBILITIES AND DENSITY FLUCTUATIONS IN K2O-SIO2 GLASSES.
Technical rept.,
N. L. Laberge, V. V. Vasilescu, C. J. Montrose, and P. B. Macedo. Sep 73, 6p Rept no. TR-25
Contract N00014-68-A-0506-0002
Availability: Pub. in Unidentified Jnl.

Descriptors: (*Fiber optics, Optical glass), (*Optical glass, Density), Potassium compounds, Oxides, Silicon dioxide, Light transmission, Scattering, Ultrasonic radiation.
Identifiers: Potassium oxides, Ultrasonic tests.

The density fluctuations contributing to light scattering in a glass are governed by the fictive temperature of the glass and the equilibrium compressibility of the melt. Using ultrasonic velocity data for K2O-SiO2 melts, these compressibilities were evaluated and the magnitude of the density fluctuations were calculated. In this system, the mean square amplitude of the fluctuations reach a minimum value (about half that of pure SiO2) for a composition of approximately 20 mol% K2O. By extrapolating the equilibrium compressibilities to zero K2O content, the density fluctuations can be calculated for pure SiO2 glass; this calculation agrees well with the result obtained from light scattering measurements. (Author)

AD-767 147/2GA Reprint
Catholic Univ of America Washington D C Vitreous State Lab
RAYLEIGH AND BRILLOUIN SCATTERING IN K20-SIO2 GLASSES.
Technical rept.,
J. Schroeder, R. Mohr, P. B. Macedo, and C. J. Montrose. 6 Apr 73, 7p Rept no. TR-26
Contract N00014-68-A-0506-0002
Revision of report dated 2 Sep 72.
Availability: Pub. in the Annual Meeting (74th), the American Ceramic Society, Washington, D.C., p1-5, 10 May 72.

Descriptors: (*Glass, Light transmission), Optical glass, Silicon dioxide, Scattering, Potassium compounds, Oxides.
Identifiers: Potassium oxides, Light scattering, Brillouin scattering.

The intensity and spectral distribution of light scattered by K2O-SiO2 glasses (K2O content up to 40 mol%) were measured. The transverse and longitudinal velocities and the photoelastic constants were evaluated from the results. The total intensity of the scattering (and therefore the attenuation caused by it) exhibited a minimum at a concentration of approximately 25 mol% K2O. For this composition the attenuation is approximately 2/3 of that in pure SiO2. This behavior results from the existence of anomalously small concentration fluctuations in the melt of K2O-3SiO2 glass. A qualitative explanation of this result, involving low-temperature immiscibility regions is presented. (Author)

AD-767 163/9GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
GOLD DECORATION OF ETCHED POLYCRYSTALLINE KCL,
Joseph J. Comer, and Charles Bergeron. 1973, 3p
Rept no. AFCRL-TR-73-0542
Availability: Pub. in Annual Proceedings of the Electron Microscopy Society of America (31st), New Orleans, La., 1973.

Descriptors: (*Infrared optical materials, Test methods), Infrared windows, Potassium compounds, Chlorides, Defects(Materials), Electron microscopy.
Identifiers: *Potassium chloride.

The paper describes the use of the gold decoration replica technique to reveal by electron microscopy slip lines, grain boundaries and dislocations in pressure induced recrystallized KCl. This material is being investigated for use as a window for lasers operating in the 10.6 micrometer range. (Author)

AD-767 164/7GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
TEMPERATURE DEPENDENCE OF INTRINSIC MULTIPHONON ABSORPTION IN CRYSTALS,
Bernard Bendow. 2 Apr 73, 3p Rept no. AFCRL-TR-73-0551
Availability: Pub. in Applied Physics Letters, v23 n3 p133-134, 1 Aug 73.

Descriptors: (*Sodium chloride, Optical properties), Infrared optical materials, Infrared windows, Potassium compounds, Bromides, Infrared radiation, Absorption spectrum.
Identifiers: Multiphonon processes, *Potassium bromide.

It is shown that in predicting the temperature dependence of multiphonon absorption one must take the temperature dependence of the phonon frequencies into account. Inclusion of the latter leads to results in improved agreement with experiment, as compared to those of Hardy and Agrawal. (Author)

AD-767 278/5GA PC$2.75/MF$1.45
Rochester Univ N Y Dept of Physics and Astronomy
ELECTROMAGNETIC RADIATION AND ITS INTERACTION WITH MATERIAL MEDIA AND ITS CONTINUATION INTERACTION OF ELECTROMAGNETIC RADIATION WITH BULK MATTER.
Final rept. 1 Aug 71-31 Jul 73,
Emil Wolf. Aug 73, 19p AROD-9407:27-P
Grants DA-ARO-D-31-124-71-G11, DA-ARO-D-31-124-72-G176

Descriptors: (*Light transmission, Scientific research), Field theory, Quantum statistics, Luminescence, Coherent radiation, Polarization, Refraction, Reflection, Partial differential equations.
Identifiers: Superradiance, Ewald-Oseen extinction theorem, Electrodynamics.

The investigations were chiefly concerned with radiation from moving charges, with molecular treatment of electrodynamics of material media and with coherence in interaction of quantized field in matter. Results of these investigations are contained in 25 papers. Titles, authors and journal references are listed and the main results are given. (Author)

AD-767 310/6GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
ELECTROMAGNETIC BEAM FIELDS,
William H. Carter. 31 Aug 73, 30p Rept no. NRL-7576

Descriptors: (*Light, Field theory), Beams(Electromagnetic), Electromagnetic fields, Monochromatic light.
Identifiers: *Laser beams, Plane waves, Evanescent waves.

An electromagnetic beam is defined using mathematical properties of the associated angular spectrum of plane waves. It is found that the usual paraxial theory for the Hermite Gaussian or Laguerre Gaussian beams, produced by some lasers, can be replaced by a more general theory which is precise according to Maxwell's equations. In this theory the beams exhibit an amplitude distribution over any plane normal to the direction of propagation which can be described using prolate spheroidal wave functions. As the degree of collimation is increased, these beams asymptotically take on the familiar Gaussian amplitude cross section. However, as the divergence from focus is increased, these beams asymptotically approach modified dipole fields. It is found that two, mutually exclusive, classes of beam fields exist. For each beam in one class there is always a complementary beam in the other class. As the degree of collimation is increased, complementary beams become almost identical. Complementary beams contain electromagnetic components which are related to one another in the same manner as between the fields of similar electric and magnetic multipoles. (Author)

AD-767 315/5GA Not available NTIS
Arizona Univ Tucson Optical Sciences Center
THE OPTICS OF RAYS, WAVEFRONTS, AND CAUSTICS,
O. N. Stavroudis. 1972, 330p AFOSR-TR-73-1652
Contract F44620-69-C-0024
Pub. as Volume 38 in the Academic Press Series of Monographs and Textbooks on Pure and Applied Physics. Library of Congress catalog card no. 72-84280.
Availability: Paper copy available from Academic Press, Inc., 111 Fifth Ave., New York, N.Y. 10003 $20.00.

Descriptors: (*Light transmission, Mathematical analysis), (*Lenses, Design), Integral equations, Partial differential equations, Analytic geometry, Wave functions, Integration, Numerical analysis.
Identifiers: Geometrical optics, Ray tracing, Caustics, Maxwells equations, Computer aided design.

The book provides a study of the mathematical foundation of geometrical optics. Included are: (a) Techniques for solving ray and wavefront problems in general inhomogeneous media-relevant particularly to the recently evolved concept of the 'inhomogeneous lens'. (b) Generalized ray tracing, a technique for calculating, in a ray neighborhood, the principal curvatures of a wavefront as it propagates through a lens. This process is immediately applicable to computer lens design programs. (c) A general solution for the eikonal equation for a homogeneous medium providing a general description of wavefronts in analytic terms. The book also treats several topics of considerable theoretical interest, including: (a) A system of equations, similar to the Maxwell equations but derived from the postulates of geometrical optics alone. (b) An algebraic theory of lens design in which lenses are represented as group elements. This treatise will be of particular importance to optical designers and optical physicists. For its formalistic treatment, mathematicians and theoretical physicists will find it considerably valuable. (Author)

AD-767 443/5GA Reprint
Notre Dame Univ Ind Electro-Optics Lab
MICROSCOPIC THEORY OF RAYLEIGH SCATTERING,
G. J. Gabriel. 24 Aug 72, 31p AFOSR-TR-73-1876
Grant AF-AFOSR-1309-67
Revision of report dated 14 Mar 72. Errata sheet included.
Availability: Pub. in Physical Review A, v8 n2 p963-990 Aug 73.

Descriptors: (*Rayleigh scattering, Statistical mechanics), Xenon, Carbon dioxide, Stochastic processes, Gases, Liquids, Partial differential equations.
Identifiers: Light scattering.

A self-consistent, microscopic theory of scattering of light by molecular aggregates is evolved from the standpoints of random-phase-modulation

theory and stochastic theory. (Modified author abstract)

AD-767 476/5GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
CONSTITUTIVE RELATIONS AND THE ELECTROMAGNETIC SPECTRUM IN A FLUCTUATING MEDIUM,
L. Mandel, and E. Wolf. 16 Apr 73, 7p AFOSR-TR-73-1725
Grant AF-AFOSR-2150-72
Availability: Pub. in Optics Communications, v8 n2 p95-99 Jun 73.

Descriptors: (*Spectroscopy, Lasers), Power spectra, Polarization, Electric fields, Scattering.
Identifiers: Laser Raman spectroscopy, Light scattering.

A two-parameter susceptibility function Chi(t,tau) is introduced, to characterize the local macroscopic properties of a linear isotropic dielectric, whose behavior may change in time. Chi(t,tau) generally is a stochastic variable with respect to its first argument. An expression is derived for the spectral density of the induced polarization in terms of the spectral densities of the fluctuations of Chi and of the electric field. In general, this relationship is not a simple convolution. In the special case when the incident electric field is monochromatic, the induced polarization has the usual Brillouin-type spectrum. (Author)

COM-73-50791/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTERPOLATION OF REFRACTIVE INDEX DATA.
Final rept.,
B. W. Morrissey, and C. J. Powell. 1973, 124p
Pub. in Applied Optics, v12 n7 p1588-1591 Jul 73.

Descriptors: (*Sapphire, Refractivity), (*Polystyrene, Refractivity), (*Cyclohexane, Refractivity), (*Refractivity, *Interpolation), Polynomials, Data processing.
Identifiers: *Cubic spline technique.

A comparison of the interpolation of index of refraction data for Czochralski sapphire, cyclohexane, and polystyrene dissolved in cyclohexane using a threeterm Sellmeier equation, the Lorentz-Lorenz equation with six terms, third and fifth order polynomials, and a cubic-spline technique indicates that the cubic spline method is extremely valuable for simple interpolation. Not only were the magnitudes of the rms and average absolute residuals the smallest, but the fits showed no systematic errors.

N73-28493/7GA PC$12.75/MF$1.45
ITT Gilfillan, Inc., Van Nuys, Calif.
MULTI MODE OPTICAL SENSOR MMOS.
Final Report.
Jun 73, 215p NASA-CR-133980, REPT-6906
Contract NAS9-11934

Descriptors: *Optical measuring instruments, *Optical scanners, Navigation aids, Specifications, Star trackers, Systems engineering.

For abstract, see STAR 1119

PATENT-3 440 419/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DUAL PURPOSE OPTICAL INSTRUMENT CAPABLE OF SIMULTANEOUSLY ACTING AS SPECTROMETER AND DIFFRACTOMETER.
Patent.
K. Dasgupta, H. W. Schnopper, and A. E. Metzger. Patented 22 Apr 69, 5p NASA-CASE-XNP-05231,
Misc-Filed 3 Feb. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Diffractometers, *Spectrometers, Optical equipment, X ray diffraction, X ray spectroscopy.

A dual purpose optical instrument is described capable of simultaneously acting as a spectrometer and diffractometer to respectively perform elemental and structural analysis of an unknown sample. The diffractometer portion of the instrument employs a modified form of Seeman-Bohlin focusing which involves providing a line source of X-rays, a sample, and a detector, all on the same focal circle. The spectrometer portion of the instrument employs a fixedly mounted X-ray energy detector mounted outside of the plane of the focal circle.

PATENT-3 677 653/GA Not available NTIS
Department of the Air Force Washington D C
LASER SENSITOMETER.
Patent,
Richard L. Hocker, Conrad P. Czerniejewski, and John D. Hopper. Filed 23 Oct 70, patented 18 Jul 72, 3p Rept nos. PAT-APPL-83 563,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Optical instruments, *Patents), (*Photographic film, Test equipment), Lasers, Lenses.
Identifiers: PAT-CL-356-256, *Sensitometers.

The patent describes a laser and a negative lens used in a sensitometer to produce a diverging beam of coherent monochromatic light which is desirable in making sensitometric test strips from light-sensitive material that is being tested for resolution response.

PATENT-3 695 766/GA Not available NTIS
Office of the Secretary of the Army Washington D C
PHOTOSENSITIVE SURFACE SHAPING FOR OPTICAL HETERODYNING.
Patent,
Dominick Giglio, and Glen Wade. Filed 14 Jan 70, patented 3 Oct 72, 5p Rept nos. PAT-APPL-2 699,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Modulators, *Patents), (*Coherent radiation, Modulation), Surfaces, Photosensitivity.
Identifiers: PAT-CL-356-141, Heterodyning, Optical modulators, Laser beams.

The patent describes a method and apparatus for optical heterodyning with photosensitive surfaces in which the amplitude of the output current is any desired function of the angle of incidence of the incident light beams. This is accomplished by shaping a photosensitive surface in accordance with the inverse Fourier transform of the desired amplitude of current response.

20G. Particle Accelerators

AD-767 645/5GA PC$4.50/MF$1.45
Naval Research Lab Washington D C
REPORT OF CYCLOTRON OPERATION 1 JANUARY-31 DECEMBER 1972.
Interim rept.
Sep 73, 140p Rept no. NRL-MR-2635

Descriptors: (*Cyclotrons, Operation), (*Nuclear reactions, Scientific research), (*Radiotherapy, Neutrons), Proton reactions, Deuteron reactions, Cancer, Medical research, Radiation measurement systems, Radiation damage, Radioactive isotopes, Dose rate, Graphics.

The report describes the research program done at the NRL Sector-Focusing Cyclotron during the year 1972. The basic research program is devoted primarily to problems involving nucleon systems and light nuclei. Experimental results of deuteron breakup by protons are compared with exact calculations, and it is concluded that the calculations are not yet using the proper nuclear potential. The problem of deuteron breakup by deuterons has been investigated with the conclusion that it is not necessary to invoke a singlet final state interaction to explain observed spectra. The neutron radiotherapy project in the applications research program is investigating the efficacy of neutrons in the treatment of cancer. A number of measurements have been performed, including neutron dose rate, neutron energy spectra, depth doses for various collimators, oxygen enhancement ratios, and radiobiological effectiveness of this beam using various biological systems. (Modified author abstract)

BNL-17680/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
PRODUCTION OF NEGATIVE PIONS OF MEDICAL INTEREST BY HIGH-ENERGY PROTONS.
D. Berley, L. N. Blumberg, D. C. Bonar, R. Fairchild, and J. D. Fox. 1973, 5p CONF-730310-39

Descriptors: (*Brookhaven ags, Pion beams), (*Radiotherapy, *Pions minus), (*Pion beams, *Beam production), Neoplasms.

For abstract, see NSA 28 02, number 03525.

BNL-17767/GA PC$3.50/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EQUIVALENT CIRCUIT ANALYSIS OF MULTIPERIODIC STRUCTURES.
W. Bauer. 20 Feb 73, 26p

Descriptors: (*Cavity resonators, *Equivalent circuits), Fabrication, Joints, Tolerances, Tuning, Waveguides.

For abstract, see NSA 28 03, number 06494.

BNL-17792/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EFFECT OF BEAM WIDTH ON THE SPACE-CHARGE NU -SHIFT DUE TO IMAGE FORCES.
M. Month, and K. Jellett. 3 Apr 73, 6p

Descriptors: (*Isabelle storage ring, *Beam dynamics), Betatron oscillations, Space charge.

For abstract, see NSA 28 02, number 03519.

BNL-17793/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EFFECT OF RF NOISE ON STORED BEAMS.
E. D. Courant. 1973, 2p CONF-730310-

Descriptors: (*Storage rings, *Beam dynamics), Betatron oscillations, Disturbances, Radiowave radiation, Synchrotron oscillations.

For abstract, see NSA 28 02, number 03520.

BNL-17820/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
VACUUM SYSTEMS FOR STORAGE RINGS.
H. J. Halama. 9 Apr 73, 14p

Descriptors: (*Storage rings, Vacuum systems), (*Vacuum systems, *Specifications), Magnetic fields.

For abstract, see NSA 28 03, number 06515.

CEA-CONF-2197/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.

PULSED POLARIZED ION SOURCE FOR THE SATURNE SYNCHROTRON.
L. Bex, J. Faure, and R. Vienet. 8p CONF-720948-14
U.S. Sales Only.

Descriptors: (*Saturne, Deuteron sources), (*Deuteron sources, *Design), Polarized beams.

For abstract, see NSA 28 02, number 03503.

CERN/ECFA-72/4(Vol.1)/GA PC$10.60/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
ECFA: 300 GEV WORKING GROUP. VOLUME I. STATUS REPORT OF THE WORKING PARTIES.
Jul 72, 450p
U.S. Sales Only.

Descriptors: (*Cern ii synchrotron, *Accelerator facilities), High energy physics, Planning.

For abstract, see NSA 28 03, number 06519.

CERN/ECFA-72/4(Vol.2)/GA PC$7.60/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
ECFA: 300 GEV WORKING GROUP. VOLUME II. PROCEEDINGS OF THE SECOND TIRRENIA STUDY WEEK, TIRRENIA, ITALY, 20--29 SEPTEMBER 1972.
Jan 73, 263p
U.S. Sales Only.

Descriptors: (*Cern ii synchrotron, *Accelerator facilities), High energy physics, Planning.

For abstract, see NSA 28 03, number 06527.

CERN/ECFA-72/4(Vol.3)/GA PC$4.00/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
ECFA: 300 GEV WORKING GROUP. VOLUME III. FINAL REPORT OF THE EXECUTIVE COMMITTEE.
Feb 73, 13p
U.S. Sales Only.

Descriptors: (*Cern ii synchrotron, *Accelerator facilities), Planning, Recommendations.

For abstract, see NSA 28 03, number 06531.

JINR-P9-6973/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
SLOW EXTRACTION OF THE BEAM FROM THE JINR SYNCHROPHASOTRON (ADJUSTMENT AND STUDY OF THE SYSTEM).
B. V. Vasilishin, V. I. Volkov, L. P. Zinov'ev, I. B. Issinskii, and S. V. Kalenov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Jinr synchrotron, *Beam extraction), Efficiency, Operation.

For abstract, see NSA 28 03, number 06503.

JINR-P9-6983/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
FORMATION OF THE MAGNETIC FIELD OF ACCELERATING UNIT IN THE MODEL OF COLLECTIVE LINEAR ACCELERATOR.
G. A. Ivanov, V. N. Mamonov, and L. V. Svetov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Electron-ring accelerators, *Magnetic fields), Solenoids.

For abstract, see NSA 28 03, number 06508.

LA-4586-MS(Rev.)/GA PC$5.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LAMPF USERS HANDBOOK (PRELIMINARY VERSION).
L. E. Jr. Agnew. Mar 73, 56p
Contract W-7405-eng-36

Descriptors: (*Lampf linac, *Research programs), Manuals, Uses.

For abstract, see NSA 28 03, number 06532.

LA-5187/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
VELOCITY DISTRIBUTIONS BY CORRELATION TECHNIQUES.
L. D. F. Allen. Apr 73, 10p
Contract W-7405-eng-36

Descriptors: (*Molecular beams, *Energy spectra), Correlations, Design, Time-of-flight method, Velocity.

For abstract, see NSA 28 03, number 05733.

LBL-1376/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
VERSATILE PATIENT POSITIONER FOR RADIATION THERAPY.
J. T. Gunn, and J. T. Lyman. Mar 73, 3p CONF-730310-53
Contract W-7405-eng-48

Descriptors: (*Uclrl cyclotrons, *Irradiation devices), (*Radiotherapy, Irradiation devices), Accelerator facilities.

For abstract, see NSA 28 02, number 03530.

LBL-1382/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
HIGH INTENSITY STOPPED K-MESON BEAM AT THE BEVATRON.
R. C. Sah, K. H. Lou, R. C. Wolgast, E. H. Hoyer, and R. A. Kilpatrick. Mar 73, 5p CONF-730310-47
Contract W-7405-eng-48

Descriptors: (*Bevatron, Kaon beams), (*Kaon beams, *Beam production), Accelerator facilities, Beam transport, Kaons plus, Linear momentum, Mev range 100-1000, Planning.

For abstract, see NSA 28 02, number 03531.

LBL-1385/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
METHOD OF ANALYZING THE MOMENTUM AND BETATRON AMPLITUDE DISTRIBUTIONS IN A CIRCULATING BEAM.
J. M. Peterson, and J. B. Rechen. Mar 73, 3p CONF-730310-46
Contract W-7405-eng-48

Descriptors: (*Electron-ring accelerators, *Beam monitoring), (*Accelerators, Beam monitoring), Beam injection, Beam profiles, Instability.

For abstract, see NSA 28 02, number 03494.

LBL-1386/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
BEVALAC: AN ECONOMICAL FACILITY FOR VERY ENERGETIC HEAVY PARTICLE RESEARCH.
A. Ghiorso, H. Grunder, W. Hartsough, G. Lambertson, and E. Lofgren. Mar 73, 4p CONF-730310-43
Contract W-7405-eng-48

Descriptors: (*Bevatron, *Planning), (*Heavy ions, *Acceleration), Superhilac.

For abstract, see NSA 28 02, number 03481.

LBL-1392/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
LARGE RECTANGULAR VACUUM WINDOWS.
J. E. Walter. Mar 73, 2p CONF-730310-48
Contract W-7405-eng-48

Descriptors: (*Bevatron, Vacuum systems), (*Vacuum systems, *Windows), Dacron, Fabrication, Mylar, Performance testing.

For abstract, see NSA 28 02, number 03495.

LBL-1393/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
BEVATRON CRYOPUMP.
R. A. Byrns, and J. T. Tanabe. Mar 73, 4p CONF-730310-51
Contract W-7405-eng-48

Descriptors: (*Bevatron, *Vacuum systems), (*Vacuum pumps, *Design), Cryogenics.

For abstract, see NSA 28 02, number 03496.

LBL-1395/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
NOISE IN PROTON ACCELERATORS.
E. Hartwig, V. K. Neil, and R. K. Cooper. Mar 73, 6p CONF-730310-45
Contract W-7405-eng-48

Descriptors: (*Bevatron, *Beam dynamics), Colliding beams, Feedback, Rf systems, Stability, Synchrotron oscillations.

For abstract, see NSA 28 02, number 03514.

LBL-1397/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
50-MEV BEVATRON INJECTION LINAC.
D. Brodzik, H. Lancaster, K. H. Lou, R. M. Richter, and J. W. Staples. Mar 73, 5p CONF-730310-40
Contract W-7405-eng-48

Descriptors: (*Bevatron, *Beam injection), Ion sources, Linear accelerators, Rf systems.

For abstract, see NSA 28 02, number 03504.

LBL-1399/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
FIRST PHASE OF HEAVY ION ACCELERATION AT THE BEVATRON.
K. C. Crebbin, D. M. Evans, R. J. Force, H. A. Grunder, and J. R. Guggemos. Mar 73, 5p CONF-730310-42
Contract W-7405-eng-48

Descriptors: (*Bevatron, Heavy ions), (*Heavy ions, *Acceleration), Ion sources, Operation.

For abstract, see NSA 28 02, number 03477.

LBL-1504/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
LBL 184-INCH SYNCHROCYCLOTRON OPERATIONAL IMPROVEMENTS.
L. R. Glasgow, L. L. Kanstein, R. W. Sorensen, and J. T. Vale. Mar 73, 4p CONF-730310-44
Contract W-7405-eng-48

Descriptors: (*Berkeley synchrocyclotron, *Operation), Beam currents, Beam transport, Radiation monitoring, Shielding.

For abstract, see NSA 28 02, number 03478.

LBL-1709/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
CURRENT UNDERSTANDING OF ERA.
L. J. Laslett. Mar 73, 5p CONF-730310-54
Contract W-7405-eng-48

Descriptors: (*Electron-ring accelerators, *Performance), Beam dynamics, Reviews.

For abstract, see NSA 28 02, number 03479.

LBL-1714/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
PEP LATTICE DESIGN.
R. Bangerter, A. Garren, L. Smith, P. Morton, and J. Rees. Mar 73, 4p CONF-730310-50, SLAC-PUB-1219
Contract W-7405-eng-48

Descriptors: (*Storage rings, *Planning), Colliding beams, Electron beams, Positron beams, Proton beams.

For abstract, see NSA 28 02, number 03521.

LBL-1746/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
PROTON--ELECTRON--POSITRON DESIGN STUDY.
Mar 73, 7p CONF-730310-52, SLAC-PUB-1220
Contract W-7405-eng-48

Descriptors: (*Storage rings, *Planning), Colliding beams, Electron beams, Positron beams, Proton beams.

For abstract, see NSA 28 02, number 03522.

LBL-1747/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
EARLY ACCELERATORS AND THEIR BUILDERS.
E. M. McMillan. Mar 73, 8p CONF-730310-55
Contract W-7405-eng-48

Descriptors: Accelerators, Reviews.

For abstract, see NSA 28 02, number 03480.

LNF-73/6/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
BEAM--BEAM LIMITS.
F. Amman. 22 Feb 73, 3p CONF-730310-49
U.S. Sales Only.

Descriptors: (*Storage rings, *Beam currents), Beams, Interactions.

For abstract, see NSA 28 03, number 06517.

N73-27143/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BEAMR: AN INTERACTIVE GRAPHIC COMPUTER PROGRAM FOR DESIGN OF CHARGED PARTICLE BEAM TRANSPORT SYSTEMS.
R. F. Leonard, and C. C. Giamati. Jul 73, 45p
NASA-TN-D-7352, E-7384

Descriptors: *Charged particles, *Computer programs, *Particle beams, Computer graphics, Magnets, Optics, Pdp computers.

For abstract, see STAR 1118

PATENT-3 705 998/GA Not available NTIS
Office of the Secretary of the Army Washington D C
NEGATIVE ION GENERATOR.
Patent,
Thomas A. Jennings, and William McNeill. Filed 27 Jan 72, patented 12 Dec 72, 5p Rept nos. PAT-APPL-221 250,
Previously filed as PAT-APPL-37 360, 5 May 70, and PAT-APPL-704 463, 9 Feb 68.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Ion sources, *Patents), Coatings, Electrochemistry, Magnets, Gas discharges, Plasma medium.
Identifiers: PAT-CL-313-161, Anodizing.

The patent describes negative ion generator for controllably and selectively generating negative ions by superposing non-uniform electric and magnetic fields, and comprising means for generating an electrostatic field within a metallic cylinder and a magnet associated therewith for producing the magnetic field, and generating the negative ions when a supply of gas is fed into the generator.

RHEL/R-252/GA PC$6.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
PROCEEDINGS OF MEETING OF THE DARESBURY--RUTHERFORD ACCELERATOR WORKING PARTY HELD AT THE COSENER'S HOUSE, ABINGDON, 16-17 DECEMBER 1971.
D. A. Gray. Apr 72, 80p CONF-711224-
U.S. Sales Only.

Descriptors: (*Accelerators, *Meetings), Leading abstract, United kingdom.

For abstract, see NSA 28 03, number 06482.

SLA-73-214/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
DEVELOPMENT OF A ROGOWSKI FARADAY CUP WITH 2.5 NANOSECOND RESPONSE TIME.
D. A. McArthur. May 73, 20p

Descriptors: (*Faraday cups, *Design), (*Electron beams, *Beam monitoring), Calibration, Kilo amp beam currents, Rogowski coil.

For abstract, see NSA 28 03, number 06498.

TID-26312/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
OBSERVATIONS ON BEAM POSITION INSTABILITIES IN THE LINAC.
M. E. Abdelaziz. 20 Sep 67, 17p

Descriptors: (*Linear accelerators, *Beam monitoring), (*Zgs, Beam monitoring), Beam position.

For abstract, see NSA 28 02, number 03497.

TID-26315/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
NONDESTRUCTIVE MEASUREMENT OF PHASE-SPACE PROPERTIES OF THE 50-MEV PROTON BEAM BETWEEN THE LINAC AND THE ZGS.
G. Concaildi, R. George, S. Marcowitz, and R. Sanders. 3 Dec 69, 9p

Descriptors: (*Zgs, *Beam monitoring), Beam injection, Beam position, Beam profiles, Linear accelerators, Phase space.

For abstract, see NSA 28 03, number 06489.

UCRL-Trans-1492/GA PC$3.00/MF$1.45
COHERENT BEHAVIOR IN THE TOMSK BETATRONS.
B. A. Moskalev. Dec 72, 5p CONF-721029-7
Translated by G. Brodell from a paper to be published in Proceedings of 3rd All-Union Conference on Particle Accelerators, Moscow, October 2, 1972.

Descriptors: (*Betatrons, *Beam dynamics), Energy losses, Scattering, X radiation.

For abstract, see NSA 28 03, number 06509.

UCRL-74285/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
ROTATING TARGET FOR INTENSE 14-MEV NEUTRON SOURCE.
R. Booth, H. H. Barschall, and E. Goldberg. 21 Feb 73, 5p CONF-730310-56

Descriptors: (*Tritium, *Targets), (*Neutron sources, Targets), Deuteron reactions, Performance, Rotation.

For abstract, see NSA 28 02, number 03532.

20H. Particle Physics

AD-767 160/5GA Reprint
Yale Univ New Haven Conn Dept of Physics
THE INTERNATIONAL CONFERENCE ON ATOMIC PHYSICS (3RD),
Vernon W. Hughes. 1973, 8p
Contracts N00014-67-A-0097-0015, F44620-71-C-0042
Sponsored in part by Grant NSF-GP-23722.
Availability: Pub. in Comments on Atomic and Molecular Physics, v4 n2 p35-41 Mar 73.

Descriptors: (*Physics, Symposia), Field theory, Atomic structure, Atoms, Particle beams, Scientific research.
Identifiers: *Atomic physics, Quantum electrodynamics, Atom atom interactions, Particle collisions.

The article briefly reports on the Third International Conference on Atomic Physcis (Boulder, Colorado; August 1972). The authors comments center on quantum electrodynamics, atomic structure, and atomic collisions.

AD-767 405/4GA Reprint
California Univ Berkeley Dept of Physics
SIMPLE NONADDITIVE DUAL RESONANCE MODEL.
Interim rept.,
Stanley Mandelstam. 7 Feb 73, 9p AFOSR-TR-73-1881
Contract F44620-70-C-0028
Availability: Pub. in the Physical Review D, v7 n12 p3777-3784 15 Jan 73.

Descriptors: (*Elementary particles, Nuclear resonance), Particle trajectories, Annihilation reactions, Nuclear scattering, Algebras.
Identifiers: Gauge conditions, Duality(Elementary particles).

A nonadditive model with spin degrees of freedom but no internal symmetry is studied. It is necessary to work in a space of ten or more dimensions in order to obtain a Hermitian Hamiltonian. The model possess physical-particle creation operators and, rather surprisingly for a nonadditive model, all trajectories are linear. In ten dimensions the model appears to be equivalent to the Neveu-Schwartz model, but the trajectories with half-integral intercept are obtained even though all our operators have integral n. The gauge conditions associated with the L and K algebras are almost certainly sufficient to remove all the ghosts. (Author)

AD-767 439/3GA PC$5.75/MF$1.45
Mathematical Applications Group Inc Elmsford N Y
SAM-CE: A THREE DIMENSIONAL MONTE CARLO CODE FOR THE SOLUTION OF THE FORWARD NEUTRON AND FORWARD AND

ADJOINT GAMMA RAY TRANSPORT EQUATIONS m REVISION B.
Final rept.,
Martin O. Cohen, Walter Guber, Eugene Troubetzkoy, Henry Lichtenstein, and Herbert Steinberg. 3 Aug 73, 248p Rept no. MR-7021-Rev-B DNA-2830F-B
Contract DNA-001-73-C-0016
See also AD-751 617.

Descriptors: (*Neutron transport theory, *Programming(Computers)), (*Gamma rays, Transport properties), Neutron cross sections, Gamma-ray cross sections, Shielding, Monte Carlo method, Geometry, Data processing systems, Instruction manuals.
Identifiers: SAM-CE computer code, FORTRAN, Combinatorial geometry, *Gamma ray transport theory.

The SAM-CE system is a FORTRAN Monte Carlo computer code designed to solve the time-dependent neutron and gamma ray transport equations in complex three-dimensional geometries. SAM-CE is applicable for forward neutron calculations and for forward as well as adjoint primary gamma ray calculations. In addition, SAM-CE is applicable for the gamma ray stage of the coupled neutron-secondary gamma ray problem, which also may be solved in either the forward or the adjoint mode. Time-dependent fluxes, and flux functionals such as dose, heating, count rates, etc., are calculated as function of energy, time and position. Multiple scoring regions are permitted and these may be either finite volume regions or point detectors or both. Other scores of interest, e.g., collision and adsorption densities, etc., are also made. A special feature of SAM-CE is its use of the 'combinatorial geometry' technique which affords the user geometric capabilities exceeding those available with other commonly used geometric packages. (Modified author abstract)

AD-767 498/9GA Reprint
Princeton Univ N J Dept of Physics
ULTRAVIOLET BEHAVIOR OF NON-ABELIAN GAUGE THEORIES,
David J. Gross, and Frank Wilczek. 27 Apr 73, 5p
AFOSR-TR-73-1679
Contract F44620-71-C-0108
Availability: Pub. in Physics Review Letters, v30 n26 p1343-1346, 25 Jun 73.

Descriptors: (*Elementary particles, Field theory), Ultraviolet radiation, Algebras, Groups(Mathematics).
Identifiers: Gauge conditions, Bjorken limit, Strong interactions, Lie groups.

It is shown that a wide class of non-Abelian gauge theories have, up to calculable logarithmic corrections, free-field-theory asymptotic behavior. It is suggested that Bjorken scaling may be obtained from strong-interaction dynamics based on non-Abelian gauge symmetry. (Author)

AD-767 499/7GA Reprint
Harvard Univ Cambridge Mass Dept of Physics
ATTEMPTS TO CALCULATE THE ELECTRON MASS,
Howard Georgi, and Sheldon L. Glashow. 12 Dec 72, 8p AFOSR-TR-73-1757
Contract F44620-70-C-0030
Availability: Pub. in Physical Review D, v7 n8 p2457-2463, 15 Apr 73.

Descriptors: (*Electrons, Nuclear models), Leptons, Quantum mechanics, Mass spectrum.
Identifiers: *Electron mass, Quantum electrodynamics, SU3 theories, Symmetry breaking, Computation.

In conventional quantum electrodynamics both the electron mass and the muon mass are free parameters, so that their ratio is arbitrary. In a unified theory of weak and electromagnetic interactions, this need not be the case. The authors examine models in which only the muon mass appears as a counterterm. The electron is massless in zeroth order, but develops a finite and calculable mass of order alpha(M sub mu). Unfortunately, the precise value of the electron mass depends on details of the models, and in particular on masses of unobserved vector bosons. (Author)

AD-767 501/0GA Reprint
Harvard Univ Cambridge Mass Dept of Physics
RENORMALIZATION OF GAUGE THEORIES, W DECAY, AND MUON DECAY,
T. W. Appelquist, J. R. Primack, and H. R. Quinn. 6 Dec 72, 13p AFOSR-TR-73-1684
Contract F44620-70-C-0030
Availability: Pub. in Physical Review D, v7 n10 p2998-3009, 15 May 73.

Descriptors: (*Elementary particles, Nuclear models), Muons, Bosons, S-matrix, Dispersion relations.
Identifiers: *Gauge conditions, *SU2 theories, Feynman diagrams, Symmetry breaking, *Muon decay.

The authors present a renormalization program for spontaneously broken gauge theories in the unitary formalism. It is compared with the renormalization program for renormalizable gauges and necessary constraints are discussed. This program is explicitly formulated for the Weinberg SU(2) x U(1) theory of leptons and shows how it provides the basis for the dispersive calculations of higher-order corrections to muon decay reported in a previous paper. As was pointed out there, certain symmetry-breaking effects are finite and calculable. In the paper, the authors calculate the breaking of muon-e universality in order alpha. The consistency is verified of the renormalization procedure on the one-loop level. (Modified author abstract)

AD-767 522/6GA Reprint
California Univ Berkeley Dept of Physics
K DEGENERACY IN NONADDITIVE DUAL RESONANCE MODELS,
Stanley Mandelstam. 7 Feb 73, 16p AFOSR-TR-73-1756
Contract F44620-70-C-0028
Availability: Pub. in Physical Review D, v7 n12 p3763-3776, 15 Jun 73.

Descriptors: (*Elementary particles, Nuclear resonance), S-matrix, Algebras, Nuclear models.
Identifiers: Gauge conditions.

The problem of K degeneracy, which has hitherto prevented calculations with nonadditive dual resonance models, is studied. It is shown that the second gauge condition selects out a unique member from each K-degenerate family. The vector so selected is not, in general, normalizable, but finite results can be obtained after renormalization. Calculation of norms and vertex functions is examined and is shown to be perfectly feasible. (Author)

AECL-4447/GA PC$3.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
SUPERALLOWED BETA DECAY.
J. C. Hardy. Mar 73, 25p CONF-730119-2
U.S. Sales Only.

Descriptors: (*Beta-plus decay, *Reviews), (*Light nuclei, Beta-plus decay), (*Argon 34, Beta-plus decay), (*Silicon 26, Beta-plus decay), Asymmetry, Ft value, Gamma spectra, Half-life.

For abstract, see NSA 28 03, number 06973.

AECL-4453/GA PC$3.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
YIELDS IN THERMAL NEUTRON FISSION. SOME RESULTS AND RECOMMENDATIONS BASED ON A RECENT EVALUATION.
W. H. Walker. Mar 73, 23p CONF-730302-11
U.S. Sales Only.

Descriptors: (*Fission yield, *Accuracy), Errors, Fission products, Thermal fission.

For abstract, see NSA 28 02, number 04200.

AERE-PR/NP-18/GA PC$8.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
NUCLEAR PHYSICS DIVISION PROGRESS REPORT FOR THE PERIOD 1ST MAY 1970 TO 30TH APRIL 1971.
C. A. Uttley, and I. M. Blair. Mar 72, 120p
U.S. Sales Only.

Descriptors: (*Van de graaff accelerators, *Operation), (*Cockcroft-walton accelerators, Operation), (*Linear accelerators, *Accelerator facilities), (*Synchrotrons, Accelerator facilities), Aere, Electrons, Industrial radiography, Nuclear physics, Research programs.

For abstract, see NSA 28 03, number 07013.

AERE-R-7302/GA PC$6.50/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
MONTE CARLO COMPUTER PROGRAM FOR NEUTRON ELASTIC SCATTERING SIMULATION.
B. H. Meardon. Jan 73, 87p
U.S. Sales Only.

Descriptors: (*Neutron reactions, *Elastic scattering), (*Computer codes, *N codes), (*Neutron transport theory, Computer codes), Bragg reflection, Cylinders, Fortran, Ibm computers, Monte carlo method, Sheets.

For abstract, see NSA 28 03, number 06933.

ANCR-1022/GA PC$7.60/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
RAFFLE GENERAL PURPOSE MONTE CARLO CODE.
W. E. Vesely, F. J. Wheeler, and R. S. Marsden. Apr 73, 243p
Contract AT(10-1)-1375

Descriptors: (*Computer codes, *R codes), (*Neutron transport theory, Computer codes), Fortran, Ibm computers, Monte carlo method, Multigroup theory, Spherical harmonics method.

For abstract, see NSA 28 03, number 06934.

CEA-R-4437/GA PC$3.50/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
GAMMA RAYS EMITTED BY SOME FISSION KRYPTONS AND XENONS AND THEIR DAUGHTER PRODUCTS.
J. Blachot, L. C. Carraz, and O. Marbach. May 73, 29p
In French. U.S. Sales Only.

Descriptors: (*Strontium 91, *Beta-minus decay), (*Krypton 87, Beta-minus decay), (*Krypton 88, Beta-minus decay), (*Rubidium 89, Beta-minus decay), Cesium 139, Errors, Gamma spectra, Xenon 138.

For abstract, see NSA 28 02, number 04118.

COM-73-50796/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
NUCLEAR SCATTERING OF PLANE-POLARIZED PHOTONS.
Final rept.,

W. C. Barber, Evans Hayward, and Jed Sazama. 1972, 5p
Pub. in Proceedings of International Conference on Nuclear Structure Studies Using Electron Scattering and Photoreaction, Sendai, Japan, 12-15 Sep 72, 5 p.

Descriptors: (*Nuclear scattering, Photons), Carbon 12, Cadmium, Tin, Tantalum, Gold, Bismuth.

A beam of plane-polarized, monochromatic photons has been produced by the resonance fluorescene of the well-known 1+ state in 12C. These have been scattered a second time from targets of cadmium, tin, tantalum, gold, and bismuth. A measurement of the number of photons scattered along and perpendicular to the polarization vector in the incident 15.1 MeV beam allows a determination of the relative contribution of incoherent and coherent scattering to the total scattering cross section. These results can be compared to the predictions of the dynamic collective model.

COM-73-50798/0GA Not available NTIS
National Bureau of Standards, Washington, C.C.
PIONIC TRANSITIONS AS TESTS OF THE CONNECTION BETWEEN CURRENT AND CONSTITUENT QUARKS.
Final rept.,
Frederick J. Gilman, Moshe Kugler, and Sydney Meshkov. 1973, 6p
Pub. in Physics Letters B (Netherlands), v45B n5 p481-486, 20 Aug 73.

Descriptors: (*Elementary particle therories, Pions), SU3 theories.
Identifiers: Quarks, Hadrons.

A proposed connection between current and constituent quarks is discussed and tested through comparison with the magnitudes and signs of amplitudes for pionic transitions between hadrons.

CONF-721018-18/GA PC$3.00/MF$1.45
Ship Research Inst., Tokai (Japan).
DISCRETE ORDINATES-NUMERICAL INTEGRATION METHOD FOR NEUTRON TRANSPORT EQUATION IN ONE AND TWO DIMENSIONAL GEOMETRIES.
K. Takeuchi, and A. Yamaji. 1972, 15p
U.S. Sales Only.

Descriptors: Boltzmann equation, Discrete ordinate method, Elastic scattering, Graphite, Inelastic scattering, Integral equations, Iron, Neutron spectra, Neutron transport theory, Neutrons, Numerical solution, One-dimensional calculations, P codes, Shielding materials, Two-dimensional calculations, Water.

For abstract, see NSA 28 02, number 04019.

CONF-730611-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
CROSS SECTION SENSITIVITY ANALYSIS FOR DISCRETE ORDINATES CALCULATIONS.
D. E. Bartine, E. M. Oblow, and F. R. Mynatt. 1972, 6p

Descriptors: (*Discrete ordinate method, *Sensitivity), (*Tissues, *Radiation doses), Cross sections, Neutron beams, Neutron transport theory, Perturbation theory.

For abstract, see NSA 28 03, number 06935.

COO-1428-319/GA PC$3.50/MF$1.45
Purdue Univ., Lafayette, Ind.
PARTIAL-WAVE ANALYSIS OF THE LOW-MASS (PI EXP + PI EXP + PI EXP -) SYSTEM PRODUCED BY INCIDENT PI EXP + MESONS AT 13 GEV/C.
G. Thompson, J. A. Gaidos, R. L. McIlwain, and R. B. Willmann. 24 Jan 73, 30p
Contract AT(11-1)-1428

Descriptors: (*Pion-proton interactions, *Partial waves), (*Pion-deuteron interactions, Partial waves), (*Pion-neutron interactions, Partial waves), (*A1-1070 resonances, *Decay), A2-1310 resonances, Bubble chambers, Conservation laws, Decay amplitudes, Delta-1236 resonances, Deuterons, Deuterons, Differential cross sections, Distribution, Emission, Gev range 10-100, Helicity, Interference, Linear momentum, Mass, Neutrons, Neutrons, Parity, Particle production, Pion beams, Pions, Pions minus, Pions plus, Protons, Protons, Resonance particles, Rho-765 resonances, S waves, Spin.

For abstract, see NSA 28 03, number 06736.

COO-1505-59/GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. Dept. Of Chemistry.
DEEXCITATION PROCESSES IN NUCLEAR REACTIONS. PROGRESS REPORT, MAY 1, 1972--APRIL 30, 1973.
N. T. Porile. May 73, 21p
Contract AT(11-1)-1505

Descriptors: (*Silver, Proton reactions), (*Proton reactions, *Spallation), (*Compound nuclei, *De-excitation), (*Proton beams, Spallation), Conservation laws, Decay, Isospin, Nuclear reaction kinetics, Cross sections, Gev range 10-100, Gev range 100-1000, Nuclear reactions.

For abstract, see NSA 28 03, number 06993.

COO-1545-117/GA PC$3.00/MF$1.45
Ohio State Univ., Columbus. Dept. Of Physics.
NEUTRINO CHARGE RADIUS IN A MODEL OF WEAK AND ELECTROMAGNETIC INTERACTIONS.
G. J. II Aubrecht, and K. Tanaka. 1972, 13p
Contract AT(11-1)-1545

Descriptors: (*Neutrinos, *Particle radii), Electric charges, Electromagnetic interactions, Heavy leptons, So groups, Symmetry, Weak interactions.

For abstract, see NSA 28 02, number 03837.

COO-1545-122/GA PC$3.75/MF$1.45
Ohio State Univ., Columbus. Dept. Of Physics.
TOPOLOGICAL CROSS SECTIONS AND CORRELATION FUNCTIONS IN HIGH ENERGY PP AND PI P COLLISIONS.
D. M. Scott, K. Tanaka, and R. Torgerson. 1973, 31p
Contract AT(11-1)-1545

Descriptors: (*Proton-proton interactions, *Cross sections), (*Pion-proton interactions, Cross sections), (*Diffraction models, *Scale invariance), (*Protons, *Pion beams), Pions minus, Pions plus, Proton beams, Topology.

For abstract, see NSA 28 03, number 06839.

COO-2171-15/GA PC$3.50/MF$1.45
Rochester Univ., N. Y. Dept. Of Physics and Astronomy.
SINGLE-PARTICLE REMOVAL ENERGIES IN MANY-BODY THEORIES.
D. S. Koltun. 12 Sep 72, 28p CONF-720933-5
Contract AT(11-1)-2171

Descriptors: (*Knock-out reactions, *Energy spectra), Binding energy, Brueckner method, Goldstone diagrams, Green function, Hartree-fock method, Many-body problem, Mev range, Single-particle model.

For abstract, see NSA 28 02, number 04220.

COO-2231-11/GA PC$3.00/MF$1.45
Kent State Univ., Ohio.
ENERGETIC-NEUTRON SPECTROMETRY. PROGRESS REPORT, 1 APRIL 1972--31 MARCH 1973.
R. Madey, and F. M. Waterman. 12p
Contract AT(11-1)-2231

Descriptors: Beryllium, Copper, Mev range 100-1000, Neutron spectrometers, Proton reactions, Time-of-flight spectrometers, Uranium.

For abstract, see NSA 28 02, number 02711.

COO-2271-1/GA PC$4.25/MF$1.45
Columbia Univ., New York. Dept. Of Physics.
W BOSON PAIRS, THEIR PHOTOPRODUCTION AND DECAY.
A. P. Sathe. 1972, 42p

Descriptors: (*Intermediate vector bosons, *Decay), (*Protons, *Photon beams), Angular distribution, Differential cross sections, Leptons, Photon-proton interactions, Photoproduction, Total cross sections.

For abstract, see NSA 28 02, number 03838.

COO-2271-10/GA PC$3.00/MF$1.45
Columbia Univ., New York.
MODEL CALCULATION OF CORRELATIONS AT HIGH ENERGY.
J. Finkelstein. 1973, 14p

Descriptors: (*Proton-proton interactions, *Inclusive interactions), (*Pions plus, *Particle production), (*Pions minus, Particle production), (*Protons, *Proton beams), Correlation functions, Multiperipheral model, Spectra.

For abstract, see NSA 28 03, number 06854.

COO-2271-2/GA PC$5.00/MF$1.45
Columbia Univ., New York. Dept. Of Physics.
TESTS FOR A WEAK NEUTRAL CURRENT IN L EXP +- + N IMPLIES L EXP +- + ANYTHING AT HIGH ENERGY.
E. Derman. 1972, 59p

Descriptors: (*Lepton-nucleon interactions, *Inclusive interactions), (*Nucleons, *Lepton beams), Cross sections, P invariance, Polarization.

For abstract, see NSA 28 02, number 03874.

COO-2271-3/GA PC$3.50/MF$1.45
Columbia Univ., New York.
TWO PHOTON PRODUCTION OF LEPTON PAIRS IN HADRON--HADRON COLLISIONS.
A. Soni. 30p

Descriptors: (*Leptons, *Pair production), (*Hadrons, *Interactions), Angular distribution, Boson-exchange models, Cross sections, Hadron-hadron interactions, Photons, Structure functions.

For abstract, see NSA 28 02, number 03890.

COO-2271-4/GA PC$5.00/MF$1.45
Columbia Univ., New York. Dept. Of Physics.
PRODUCTION PROCESSES AT HIGH ENERGY.
A. H. Mueller. 1972, 56p CONF-720954-21

Descriptors: (*Particle models, *Multiple production), Correlations, Hadrons, Inclusive interactions, Limiting fragmentation, Strong interactions.

For abstract, see NSA 28 03, number 06810.

COO-2271-8/GA PC$3.00/MF$1.45
Columbia Univ., New York.
RADIATIVE CORRECTIONS TO P + P IMPLIES I EXP + + I EXP - + 'ANYTHING' AND

APPLICATION TO MUON--ELECTRON SYMMETRY.
A. Soni. 1972, 12p

Descriptors: (*Hadron-hadron interactions, *Inclusive interactions), (*Electrons, *Asymmetry), (*Muons, Asymmetry), Antileptons, Cross sections, Leptons, Pair production, Photons, Radiative corrections.

For abstract, see NSA 28 02, number 03891.

COO-2271-9/GA PC$4.50/MF$1.45
Columbia Univ., New York.
THEORY OF SPONTANEOUS T VIOLATION.
T. D. Lee. 1973, 48p

Descriptors: (*Kaons neutral long-lived, *Decay), (*Kaons neutral short-lived, Decay), Expectation value, Field theories, Gauge invariance, Lagrangian function, Leptons, Renormalization, Spin, Symmetry breaking, T invariance.

For abstract, see NSA 28 03, number 06865.

COO-3001-34/GA PC$3.00/MF$1.45
State Univ. Of New York, Stony Brook. Dept. Of Physics.
EXCHANGE CURRENT EFFECTS IN NP IMPLIES D GAMMA AND BACKWARD ED IMPLIES ENP.
D. O. Riska. 1972, 4p
Contract AT(11-1)-3001

Descriptors: (*Protons, *Neutron beams), (*Deuterons, *Electron beams), Boson-exchange models, Cross sections, Mesons, Ope model, Electron-deuteron interactions, Electrons, Neutrons, Photons, Proton-neutron interactions.

For abstract, see NSA 28 03, number 06855.

COO-3001-35/GA PC$3.50/MF$1.45
State Univ. Of New York, Stony Brook. Dept. Of Physics.
NUCLEON--NUCLEON INTERACTION FROM PION--NUCLEON PHASE SHIFT ANALYSIS.
R. Vinh Mau, J. M. Richard, B. Loiseau, M. Lacombe, and W. N. Cottingham. 1972, 26p
Contract AT(11-1)-3001

Descriptors: (*Nucleon-nucleon interactions, *Partial waves), (*Nucleons, *Nucleon beams), Energy dependence, Phase shift, Pion-nucleon interactions, Pion-pion interactions.

For abstract, see NSA 28 02, number 03933.

COO-3129-33/GA PC$3.00/MF$1.45
Brown Univ., Providence, R. I. Dept. Of Physics.
ELECTROEXCITATION FORM FACTORS AND FIXED-MULTIPOLARITY SUM RULES.
T. J. Deal, and S. Fallieros. 1973, 10p
Contract AT(11-1)-3129

Descriptors: (*Lithium 6, *Energy levels), Electron reactions, Excited states, Form factors, Functions, Inelastic scattering, Linear momentum, Multipolarity, Sum rules.

For abstract, see NSA 28 02, number 04048.

COO-3130-TB-174/GA PC$3.00/MF$1.45
Brown Univ., Providence, R. I. Dept. Of Physics. Brookhaven National Lab., Upton, N. Y.
BACKWARD PI-MINUS CHARGE EXCHANGE AT INTERMEDIATE MOMENTUM.
C. DeMarzo, L. Guerriero, C. Nicolini, E. Vaccari, and F. Waldner. 1972, 13p CONF-720954-20

Descriptors: (*Pion-proton interactions, *Differential cross sections), (*Protons, *Pion beams), Gev range 01-10, Linear momentum, Neutrons, Particle production, Pions minus, Pions neutral.

For abstract, see NSA 28 02, number 03806.

COO-881-380/GA PC$7.25/MF$1.45
Wisconsin Univ., Madison.
SEARCH FOR THE RARE DECAY, K EXP + IMPLIES PI EXP + E EXP + E-.
D. B. Clarke. 1973, 101p

Descriptors: (*Kaons plus, *Leptonic decay), Branching ratio, Dalitz plot, Electrons, Pions plus, Positrons.

For abstract, see NSA 28 03, number 06727.

DESY-73/5/GA PC$6.75/MF$1.45
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
MEASUREMENT OF PROTON AND NEUTRON ELECTROMAGNETIC FORM FACTORS AT SQUARED FOUR-MOMENTUM TRANSFERS UP TO 3 (GEV/C) EXP 2 .
W. Bartel, F. W. Buesser, W. R. Dix, R. Felst, and D. Harms. Mar 73, 94p
U.S. Sales Only.

Descriptors: (*Protons, *Electromagnetic form factors), (*Neutrons, Electromagnetic form factors), (*Electron-proton interactions, *Elastic scattering), Cross sections, Electron-deuteron interactions, Electron-neutron interactions.

For abstract, see NSA 28 02, number 03787.

DESY-73/8/GA PC$3.00/MF$1.45
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
DOES RHO'(1650) CONTRIBUTE TO THE NUCLEON FORM FACTOR.
J. Bellandi Filho, and R. F. Meyer. Mar 73, 12p
U.S. Sales Only.

Descriptors: (*Nucleons, *Form factors), Coupling constants, Rho-1600 resonances, Vector dominance model, Vector mesons.

For abstract, see NSA 28 02, number 03914.

EIR-232/GA PC$5.00/MF$1.45
Eidgenoessisches Institut fuer Reaktorforschung, Wuerenlingen (Switzerland).
NEW SPATIAL DIFFERENCING FOR THE NEUTRON TRANSPORT EQUATION.
J. J. Arkuszewski. Feb 73, 57p
U.S. Sales Only.

Descriptors: (*Neutron transport theory, Computer codes), (*Computer codes, *D codes), Discrete ordinate method, Two-dimensional calculations.

For abstract, see NSA 28 02, number 04020.

FEI-323/GA PC$3.50/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
NEUTRON THERMALIZATION IN BEO AND BE-SYSTEMS OF FINITE SIZE.
V. A. Kuznetsov, M. Ya. Bankrashkova, V. N. Bogomolov, P. E. Bulavin, and V. M. Dekusar. 1972, 26p
In Russian. U.S. Sales Only.

Descriptors: (*Beryllium, *Neutron spectra), (*Beryllium oxides, Neutron spectra), (*Neutrons, *Thermalization), (*Beryllium moderators, Neutron spectra), Neutron flux, Pulsed neutron techniques, P1-approximation, Scalars, Vectors.

For abstract, see NSA 28 02, number 04021.

FEI-325/GA PC$3.50/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
CLASSIFICATION OF TECHNIQUES FOR MEASURING THE RATIO OF NEUTRON CAPTURE CROSS SECTION TO FISSION CROSS SECTION.
A. A. Van'kov, and Yu. V. Grigor'ev. 1972, 27p
In Russian. U.S. Sales Only.

Descriptors: (*Capture-to-fission ratio, *Measuring methods), Capture, Fission, Gamma radiation, Neutron reactions, Nuclei.

For abstract, see NSA 28 02, number 04201.

FRNC-TH-339/GA PC$8.75/MF$1.45
Paris Univ. (France).
PHENOMENOLOGICAL STUDY OF AMPLITUDES AT ANY ENERGY AND FOR ANY ANGLE UNITARITY, DUALITY, AND ABSORPTION.
R. Lacaze. 1972, 134p
In French. U.S. Sales Only.

Descriptors: (*Pion-pion interactions, *Scattering amplitudes), (*Baryon-baryon interactions, Scattering amplitudes), Absorption, Antiparticles, Crossing symmetry, Diagrams, Duality, Exchange degeneracy, Pomeranchuk particles, Regge poles, Resonance particles, Strong interactions, Sum rules, Unitarity.

For abstract, see NSA 28 02, number 03903.

FRNC-TH-340/GA PC$6.25/MF$1.45
Caen Univ. (France).
DISTORTED WAVE ANALYSIS OF (P,2P) REACTIONS AT 600 MEV.
F. Lemeilleur. 1971, 82p
In French. U.S. Sales Only.

Descriptors: (*Proton reactions, *Knock-out reactions), (*Carbon 12, Proton reactions), (*Silicon 28, Proton reactions), (*Calcium 40, Proton reactions), Aluminium 27, Binding energy, Boron 11, Cross sections, Distorted wave theory, Dwba, Energy spectra, Impulse approximation, Mev range 100-1000, Nuclear reaction kinetics, Potassium 39, Protons, Recoils, Titanium 50, Vanadium 51, Wave functions, Yttrium 89, Zirconium 90, Nuclear radii, Nuclear structure, Shell models.

For abstract, see NSA 28 02, number 04097.

FRNC-TH-355/GA PC$7.75/MF$1.45
Paris Univ. (France).
SEARCH FOR COLLECTIVE TYPE EXCITED STATES IN EXP 184 PT, EXP 186 PT, EXP 188 PT, EXP 190 PT, EXP 192 PT AND EXP 182 OS, EXP 184 OS AND EXP 186 OS NUCLEI.
J. P. Husson. 1972, 112p
In French. U.S. Sales Only.

Descriptors: Coincidence methods, Electron capture decay, Electrons, Energy spectra, Gamma spectra, Gold 188, Half-life, Internal conversion, Iridium 182, Iridium 184, Beta-plus decay, Gold 186, Gold 190, Deformed nuclei, Energy levels, Energy-level transitions, Multipolarity, Parity, Platinum 190, Platinum 192, Probability, Rotational states, Spin, Vibrational states, Gold 184, Iridium 186, K conversion, Lifetime, Osmium 184, Platinum 184, Platinum 186, Platinum 188, Mercury 182, Mercury 184, Mercury 186, Mercury 188.

For abstract, see NSA 28 03, number 07016.

IC-73/22/GA PC$3.00/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
VECTOR AND TENSOR GAUGE PARTICLES IN SL(6,C) THEORY.
C. J. Isham, A. Salam, and J. Strathdee. Mar 73, 7p
U.S. Sales Only.

Descriptors: (*Sl groups, *Meson resonances), Gauge invariance, Lagrangian function, Parity, Spin.

For abstract, see NSA 28 02, number 03954.

IC-73/28/GA PC$3.25/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
ON SL(6,C) GAUGE INVARIANCE.
A. Salam. Mar 73, 21p CONF-730124-1
U.S. Sales Only.

Descriptors: (*Meson resonances, Sl groups), (*Sl groups, *Gauge invariance), Algebra, Parity, Reviews, Spin, Tensors, Unitarity.

For abstract, see NSA 28 03, number 06868.

IC-73/34/GA PC$3.25/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
MAGNETIC CHARGES AND STRINGS AS BUILDING BLOCKS OF HADRONS: CONNECTION BETWEEN ELECTROMAGNETIC AND DUAL STRINGS.
A. O. Barut. Apr 73, 21p
U.S. Sales Only.

Descriptors: (*Protons, *Particle structure), Current algebra, Duality, Form factors, Inelastic scattering, Magnetic fields, Magnetic monopoles, Mass, Multiplets, Particle models, Protons, Spectra, Spectra, String models, Structure functions.

For abstract, see NSA 28 02, number 03915.

IFA-NR-41-1972/GA PC$3.00/MF$1.45
Institutul de Fizica Atomica, Bucharest (Romania).
MULTILEVEL CALCULATION OF EXP 235 U NEUTRON FISSION CROSS-SECTION.
I. M. Mihailescu, and M. Petrascu. 1972, 10p
U.S. Sales Only.

Descriptors: (*Uranium 235, Neutron reactions), (*Neutron reactions, *Thermal fission), Bound state, Computer codes, Epithermal neutrons, Ev range 01-10, Excitation functions, Fortran, Ibm computers, Level widths, Milli ev range, R matrix, Thermal neutrons.

For abstract, see NSA 28 02, number 04202.

IFVE-SPK-72-35/GA PC$3.75/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Serpukhov. Institut Fiziki Vysokikh Energii.
PRODUCTION OF CHARGED LEPTONIC PAIRS BY HIGH-ENERGY NEUTRINOS ON NUCLEONS AND NUCLEI IN THE THEORY WITH INTERMEDIATE W-BOSON.
V. V. Makeev, P. L. Nevskii, Yu. P. Nikitin, G. V. Rozhnov, and A. A. Sokolov. 1972, 32p
In Russian. U.S. Sales Only.

Descriptors: Differential cross sections, Intermediate vector bosons, Muons minus, Neutrino reactions, Neutrino-nucleon interactions, Nuclei, Total cross sections.

For abstract, see NSA 28 02, number 03875.

IFVE-STF-72-55/GA PC$3.25/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Serpukhov. Institut Fiziki Vysokikh Energii.
ANALYSIS OF DISPERSION RELATIONS FOR PION--NUCLEON SCATTERING AT HIGH ENERGIES.
L. D. Solov'ev, and A. V. Shchelkachev. 1972, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-nucleon interactions, *Scattering amplitudes), Corrections, Dispersion relations, Gev range 10-100, Gev range 100-1000.

For abstract, see NSA 28 02, number 03916.

INS-J-140/GA PC$3.50/MF$1.45
Tokyo Univ. (Japan). Inst. For Nuclear Study.
3 EXP + STATE IN EVEN--EVEN MEDIUM SOFT NUCLEI.
M. Sakai. 15 Mar 73, 30p CONF-730123-1
U.S. Sales Only.

Descriptors: (*Even-even nuclei, *Energy levels), (*Arsenic 75, *Proton reactions), (*Bromine 79, Proton reactions), (*Bromine 81, Proton reactions), Collective model, Deformed nuclei, Nuclear structure, Antimony 121, Gamma spectra, Krypton 78, Krypton 80, Mev range 10-100, Neutrons, Rubidium 85, Selenium 74, Strontium 84, Tellurium 120, Parity, Spin, Tellurium 119, Beta-plus decay, Electron capture decay, Ft value, Praseodymium 136, Technetium 96.

For abstract, see NSA 28 03, number 06994.

ITF-72-103-E/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
FINITE-ENERGY UPPER BOUND FOR THE TOTAL CROSS-SECTION.
Yu. M. Lomsadze, and V. G. Drobnich. 1972, 8p
U.S. Sales Only.

Descriptors: (*Elementary particles, *Interactions), Boundary conditions, Energy, Partial waves, Scattering amplitudes, Total cross sections, Two-body problem, Unitarity.

For abstract, see NSA 28 02, number 03824.

ITF-72-109-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
CALCULATION OF CROSS-SECTION OF THE REACTION EXP 3 HE(E,E'P) EXP 2 H BY THE K-HARMONIC METHOD. COMPARISON WITH OTHER CALCULATIONS.
V. K. Tartakovskii, and I. V. Kozlovskii. 1972, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Helium 3, Electron reactions), (*Electron reactions, *Knock-out reactions), Angular distribution, Deuterium, Differential cross sections, Electrons, Form factors, Mev range 100-1000, Protons, Wave functions.

For abstract, see NSA 28 02, number 04031.

ITF-72-162-E/GA PC$3.25/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
PROBLEM OF FOUR IDENTICAL PARTICLES WITH SEPARABLE INTERACTION.
V. F. Kharchenko, and V. E. Kuzmichev. 1972, 23p
U.S. Sales Only.

Descriptors: (*Helium 4, *Energy levels), Binding energy, Bound state, Energy, Ground states, Integral equations, Interactions, Motion, Wave functions.

For abstract, see NSA 28 03, number 06940.

ITF-72-190-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
CORRECTIONS TO A DIFFRACTIONAL APPROXIMATION.
A. D. Polozov. 1972, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Nuclear reactions, *Diffraction models), Corrections, Elastic scattering, Equations, Matrix elements, Motion, Nucleons, Scattering amplitudes.

For abstract, see NSA 28 03, number 06856.

ITF-72-81-E/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
BROKEN NONLINEAR CHIRAL SU(2) X SU(2) DYNAMICS INDEPENDENT OF PARAMETRIZATION.
V. N. Gulii, and V. Ya. Sabo. 1972, 9p
U.S. Sales Only.

Descriptors: (*Pion-nucleon interactions, Su-2 groups), (*Su-2 groups, *Symmetry breaking), Chirality, Mass, Nonlinear problems, Pions, Scattering amplitudes.

For abstract, see NSA 28 02, number 03955.

ITF-72-83-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
TWO-PARTICLE T-MATRIX FACTORIZATION AND A THREE-NUCLEON PROBLEM WITH GAUSSIAN POTENTIAL.
N. M. Petrov. 1972, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Nucleons, *Three-body problem), Factorization, Gauss potential, Motion, Nucleon-nucleon potential, S matrix, Two-body problem.

For abstract, see NSA 28 02, number 03917.

ITF-72-89-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
RELATION BETWEEN THE CROSS-SECTIONS FOR PHOTON REACTIONS.
M. A. Zabolotnyi. 1972, 14p
In Russian. U.S. Sales Only.

Descriptors: (*Photonuclear reactions, *Cross sections).

For abstract, see NSA 28 02, number 04221.

ITF-72-93-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
DIFFRACTIONAL PROTON SCATTERING BY A DEFORMED NUCLEUS.
I. S. Dotsenko, and A. D. Fursa. 1972, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Proton reactions, *Elastic scattering), (*Carbon 12, Proton reactions), Diffraction models, Energy levels, Excitation, Gev range 01-10, Harmonic oscillators, Inelastic scattering, Nuclear deformation, Wave functions.

For abstract, see NSA 28 02, number 03934.

ITF-73-30-E/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
QUASI-INDEPENDENT QUARK MODEL AND HADRON ELECTROMAGNETIC FORMFACTORS AT LARGE TRANSFERRED MOMENTA.
V. F. Dushenko, and A. P. Kobushkin. 1973, 12p
U.S. Sales Only.

Descriptors: (*Hadrons, *Electromagnetic form factors), (*Quark model, Electromagnetic form factors), Bound state, Linear momentum transfer, Quarks, Scalars.

For abstract, see NSA 28 03, number 06811.

ITF-73-31-E/GA PC$4.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
FOURIER TRANSFORMATION OF GROUP FUNCTIONS. (PART) I.
A. Y. Klimyk. 1973, 38p
U.S. Sales Only.

Descriptors: (*Lie groups, *Fourier transformation).

For abstract, see NSA 28 03, number 06863.

ITF-73-37-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
CONSIDERATION OF THE INFLUENCE OF FINITNESS OF PI -N INTERACTION RADIUS ON PI -D SCATTERING LENGTH.
N. M. Petrov, and V. V. Peresypkin. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-deuteron interactions, *Scattering lengths), Faddeev equations, Interaction range, Nucleon-nucleon interactions, Nucleon-nucleon potential, Pion-nucleon interactions, Pion-pion interactions.

For abstract, see NSA 28 03, number 06857.

ITF-73-6-P/GA PC$3.25/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
REPRESENTATIONS (LAMBDA SUB 0 ,C) EXP + OF THE GROUP SL(2,C) IN THE FOCK--BARGMAN REALIZATION.
S. S. Sannikov. 1973, 24p
In Russian. U.S. Sales Only.

Descriptors: Algebra, Mathematical space, Sl groups.

For abstract, see NSA 28 03, number 06862.

JINR-E-26992/GA PC$6.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
EXTENSION OF THE S-MATRIX OFF THE MASS SHELL AND MOMENTUM SPACE OF CONSTANT CURVATURE.
A. D. Donkov, V. G. Kadyshevsky, M. D. Mateev, and R. M. Mir-Kasimov. 1973, 87p CONF-721219-3
U.S. Sales Only.

Descriptors: Causality, Elementary particles, Interactions, Linear momentum, Mass, Mathematical space, Quantum field theory, S matrix.

For abstract, see NSA 28 02, number 03959.

JINR-E2-6926/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
CLASS OF S-MATRIX PROBLEMS WITH A WEAKENED CONDITION OF ANALYTICITY.
I. P. Nedelkov. 1973, 20p
U.S. Sales Only.

Descriptors: (*S matrix, *Scattering amplitudes), Crossing symmetry, Unitarity.

For abstract, see NSA 28 02, number 03958.

JINR-P1-6961/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
DOUBLE CHARGE EXCHANGE OF PI EXP + - MESONS ON EXP 209 BI NUCLEI.
Yu. A. Batusov, Zh. Ganzoring, I. V. Dudova, B. P. Osipenko, and V. M. Sidorov. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Bismuth 209, Pion reactions), (*Pion reactions, *Charge-exchange reactions), Astatine isotopes, Astatine 207, Astatine 211, Boundary conditions, Cross sections, Knock-out reactions, Neutrons, Nuclear reaction kinetics, Pions minus, Pions plus.

For abstract, see NSA 28 02, number 04183.

JINR-P1-6988/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
INVESTIGATION OF THE PI EXP - P IMPLIES PI EXP + PI EXP - N REACTION NEAR THRESHOLD.
Yu. A. Batusov, S. A. Bunyatov, G. R. Gulkanyan, V. S. Kurbatov, and V. M. Sidorov. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: Linear momentum, Matrix elements, Mev range 100-1000, Neutrons, Particle production, Pion-proton interactions, Pions, Pions minus, Pions plus, Scattering amplitudes, Spectra.

For abstract, see NSA 28 02, number 03807.

JINR-P2-6937/GA PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
INVESTIGATION OF NONRELATIVISTIC PARTICLE INTERACTION WITH QUANTIZED SCALAR FIELD BY FUNCTIONAL INTEGRATION METHOD.
S. P. Kuleshov, V. A. Matveev, A. N. Sisakyan, and M. A. Smondyrev. 1973, 27p CONF-721219-1
In Russian. U.S. Sales Only.

Descriptors: Corrections, Elementary particles, Functionals, Functions, Green function, Integrals, Interactions, Polarons, Quantum field theory, Scalar fields.

For abstract, see NSA 28 02, number 05034.

JINR-P2-6981/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
APPLICATION OF ACCELERATED CONVERGENCE EXPANSION FOR THE PHASE SHIFT ANALYSIS OF THE ELASTIC PI EXP +-4 HE SCATTERING.
O. V. Dumbrais, F. Nikitinu, and Yu. A. Shcherbakov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Pion reactions, *Elastic scattering), (*Helium 4, Pion reactions), Mev range 10-100, Mev range 100-1000, Partial waves, Phase shift, Pions minus, Pions plus, Series expansion.

For abstract, see NSA 28 03, number 06941.

JINR-P2-7029/GA PC$3.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
APPROXIMATE SOLUTIONS IN THE H EXP 2 /4 PHI EXP 4 MODEL AND EQUATIONS ON TRAJECTORIES FOR THE GREEN FUNCTIONS.
B. M. Barbashov, and V. V. Nesterenko. 1973, 27p
In Russian. U.S. Sales Only.

Descriptors: (*Scattering amplitudes, *Elastic scattering), Green function, Lagrangian function, Quantum field theory.

For abstract, see NSA 28 03, number 06874.

JINR-P2-7047/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
INVARIANT VARIETIES OF THE CHEW--LOW EQUATION (CONTINUATION).
V. A. Meshcheryakov. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-nucleon interactions, *Chew-low method), Equations, Group theory, Series expansion.

For abstract, see NSA 28 02, number 03918.

KFKI-73-7/GA PC$3.25/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
UNITARY REPRESENTATIONS OF THE SL(2,C) GROUP IN HOROSPHERIC BASIS.
M. Huszar. 1972, 24p
U.S. Sales Only.

Descriptors: (*Sl groups, *Unitarity), Matrix elements.

For abstract, see NSA 28 02, number 03947.

LA-5157-MS/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
MONTE CARLO PHOTON CODES: MCG AND MCP.
E. D. Cashwell, J. R. Neergaard, C. J. Everett, R. G. Schrandt, and W. M. Taylor. Mar 73, 45p
Contract W-7405-eng-36

Descriptors: (*Gamma transport theory, *Computer codes), Coherent scattering, Incoherent scattering, Kev range, M codes, Mev range, Monte carlo method.

For abstract, see NSA 28 03, number 07190.

LA-5190-C/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
PROCEEDINGS OF THE SIXTH LAMPF USERS MEETING HELD AT UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO, NOVEMBER 13--14, 1972.
S. Partridge, and H. H. Howard. Mar 73, 112p
CONF-721124-
Contract W-7405-eng-36

Descriptors: (*Lampf linac, *Planning), (*Nuclear physics, *Research programs), (*High energy physics, Research programs), (*Nuclear medicine, Research programs), Accelerator facilities, Meetings.

For abstract, see NSA 28 02, number 03476.

LBL-1051/GA PC$7.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
STRANGE-PARTICLE PRODUCTION IN PI EXP + D INTERACTIONS AT 2.7 TO 4.2 GEV/C.
P. L. Hoch. 16 Oct 72, 100p
Contract W-7405-eng-48

Descriptors: (*K-892 resonances, *Mass difference), Bubble chambers, Cross sections, D-1285 resonances, Distribution, E-1422 resonances, Gev range 01-10, Kaons plus, Lambda particles, Linear momentum, Particle production, Pion-deuteron interactions, Pion-neutron interactions, Pion-proton interactions, Pions neutral, Pions neutral, Pions plus, Protons, Protons.

For abstract, see NSA 28 02, number 03808.

LBL-1347/GA PC$7.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
DOUBLE-CHARGE-EXCHANGE AND INELASTIC SCATTERING IN PI EXP - + EXP 3 HE.
J. M. Sperinde. 4 Aug 71, 97p
Contract W-7405-eng-48

Descriptors: (*Pion reactions, *Charge-exchange reactions), (*Helium 3, Pion reactions), Bound state, Boundary conditions, Differential cross sections, Energy, Inelastic scattering, Linear momentum, Neutrons, Spectra.

For abstract, see NSA 28 02, number 04032.

LBL-1647/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.

THEORETICAL STUDY OF TWO NUCLEON TRANSFER BETWEEN HEAVY IONS INCLUDING THE EFFECT OF INELASTIC PROCESSES.
N. K. Glendenning, and R. J. Ascuitto. Mar 73, 20p CONF-730312-7
Contract W-7405-eng-48

Descriptors: (*Tin 120, Oxygen 18 reactions), (*Oxygen 18 reactions, *Stripping), (*Heavy ion reactions, *Nuclear reaction kinetics), Angular distribution, Coupled channel theory, Cross sections, Dwba, Mev range 10-100, Mev range 100-1000, Neutron transfer, Tin 122, Transfer reactions.

For abstract, see NSA 28 02, number 04137.

LBL-1736/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
RADIATIVE PION CAPTURE IN NUCLEI.
H. W. Baer, and K. M. Crowe. Mar 73, 15p CONF-730301-5
Contract W-7405-eng-48

Descriptors: (*Lithium 6, *Pion reactions), Capture, Giant resonance, Nuclear structure, Nuclei, Photons, Pion beams, Pions minus.

For abstract, see NSA 28 03, number 07058.

LBL-555/GA PC$6.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
SELECTED TOPICS IN BARYON RESONANCES.
A. Barbaro-Galtieri. Aug 72, 78p
Contract W-7405-eng-48

Descriptors: (*Baryon resonances, *Reviews), Decay, Delta-1236 resonances, Emission, Lambda-1520 resonances, Lambda-1690 resonances, Lectures, Pions, Sigma-1385 resonances, Su-3 groups.

For abstract, see NSA 28 02, number 03919.

LNF-72/105/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
HOW TO MEASURE THE DIMENSION OF THE PARTON FIELD.
G. Parisi. 11 Dec 72, 10p
U.S. Sales Only.

Descriptors: (*Parton model, *Field operators), (*Electron-proton interactions, Parton model), Dyson representation, Inelastic scattering, Quantum field theory, Scaling laws, Structure functions.

For abstract, see NSA 28 02, number 03840.

LNF-72/55/GA PC$4.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
PHOTOPRODUCTION OF PIONS ON NUCLEONS IN THE DELTA (1236) RESONANCE REGION.
A. Jurewicz. 13 Jun 72, 42p
U.S. Sales Only.

Descriptors: (*Pions, *Photoproduction), Delta-1236 resonances, Electric dipole moments, Lectures, Lectures, Magnetic dipole moments, Photon-nucleon interactions, Tensors.

For abstract, see NSA 28 02, number 03839.

LNF-73/2/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
DEEP INELASTIC SCATTERING IN A FIELD THEORY WITH COMPUTABLE LARGE-MOMENTA BEHAVIOUR.
G. Parisi. 22 Jan 73, 6p
U.S. Sales Only.

Descriptors: (*Electron-positron interactions, *Annihilation), (*Quantum field theory, *Inelastic scattering), Structure functions.

For abstract, see NSA 28 02, number 03841.

LYCEN-7241/GA PC$6.00/MF$1.45
Lyon Univ. (France). Institut de Physique Nucleaire.
PROTON EMISSION SPECTRA IN ALPHA INDUCED NUCLEAR REACTIONS AT 54.8 MEV. DE-EXCITATION BEFORE STATISTICAL EQUILIBRIUM IS REACHED.
Jul 72, 78p
In French. U.S. Sales Only.

Descriptors: (*Alpha reactions, *Compound nucleus reactions), (*Vanadium 51, Alpha reactions), (*Iron 56, Alpha reactions), (*Cobalt 59, Alpha reactions), Angular distribution, Angular distribution, Compound nuclei, Cross sections, De-excitation, Differential cross sections, Energy spectra, Equilibrium, Evaporation model, Mev range 10-100, Nuclear reaction kinetics, Protons, Antimony 119, Cadmium 110, Cadmium 112, Chromium 54, Copper 63, Copper 65, Gallium 69, Gold 197, Indium 115, Mercury 200, Molybdenum 96, Niobium 93, Silver 107, Silver 109, Tantalum 181, Tin 116, Tin 118, Tungsten 184, Zinc 66, Zinc 68, Nickel 62.

For abstract, see NSA 28 02, number 04138.

N-70-42026/GA PC$5.45/MF$1.45
Brown Engineering CO., Inc., Huntsville, Ala.
CAVEAT: REVISED VERSION OF THE GENERAL PURPOSE MONTE CARLO PROGRAM, COHORT. VOLUME 1. THEORY AND TECHNIQUES. REVISED.
N. R. Byrn. Apr 70, 66p NASA-CR-102878, SE-290(Vol.1)(Rev.)
Contract NAS8-20166

Descriptors: (*Neutron transport theory, *Computer codes), (*Gamma transport theory, Computer codes), Air, C codes, Monte carlo method.

For abstract, see NSA 28 03, number 07191.

N-70-42027/GA PC$5.45/MF$1.45
Brown Engineering CO., Inc., Huntsville, Ala.
CAVEAT: REVISED VERSION OF THE GENERAL PURPOSE MONTE CARLO PROGRAM, COHORT. VOLUME 2. USERS' MANUAL. REVISED.
N. R. Byrn. Aug 69, 128p NASA-CR-102877, SE-290(Vol2.)(Rev.)
Contract NAS8-20166

Descriptors: (*Computer codes, *C codes), (*Neutron transport theory, Computer codes), (*Gamma transport theory, Computer codes), Manuals, Monte carlo method.

For abstract, see NSA 28 03, number 07192.

NP-19731/GA PC$3.00/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
NEGATIVE PARITY STATES AND ANHARMONIC EFFECTS IN THE SPECTRA OF EVEN-EVEN VIBRATIONAL NUCLEI.
L. Kocbach. Dec 72, 20p
U.S. Sales Only.

Descriptors: (*Even-even nuclei, *Vibrational states), (*Samarium 148, Vibrational states), (*Samarium 150, Vibrational states), Deformed nuclei, Excited states, Intermediate coupling, Octupoles, Quadrupoles, Unified model.

For abstract, see NSA 28 02, number 04222.

NP-19737/GA PC$6.50/MF$1.45
Oslo Univ. (Norway). Fysisk Institutt.
STUDIES IN HIGH ENERGY PHENOMENOLOGY OF TWO-BODY PROCESSES.
J. Froeyland. Apr 72, 87p
U.S. Sales Only.

Descriptors: (*Pseudoscalar mesons, *Photoproduction), (*Proton-neutron interactions, *Charge-exchange interactions), (*Neutron-antineutron interactions, Charge-exchange interactions), Antinucleons, Isospin, Kaons minus, Kaons neutral, Kaons plus, Nucleons, Particle models, Photon-nucleon interactions, Pions minus, Pions neutral, Pions plus, Regge cuts, Regge poles, Scattering, Strong interactions.

For abstract, see NSA 28 03, number 06761.

NP-19741/GA PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
NOTE ON PERTURBATION THEORY FOR THREE-PARTICLE SCATTERING.
Gy. Bencze, and P. Doleschall. 1972, 12p
U.S. Sales Only.

Descriptors: (*Neutron-deuteron interactions, *Perturbation theory), Cross sections, Elastic scattering, Polarization, Tensors, Three-body problem, Vectors.

For abstract, see NSA 28 02, number 03935.

NP-19742/GA PC$4.25/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
EFFECTIVE THREE-BODY PROBLEMS IN NUCLEAR REACTIONS.
Gy. Bencze. 1972, 42p
U.S. Sales Only.

Descriptors: (*Nuclear reactions, *Three-body problem), Direct reactions, Resonance, Scattering.

For abstract, see NSA 28 02, number 04223.

NP-19744/GA PC$3.00/MF$1.45
Jyvaskyla Univ. (Finland). Dept. Of Physics.
ENERGY-MOMENTUM CONSERVATION EFFECTS IN THE INCLUSIVE TWO PARTICLE CORRELATION FROM 18 GEV/C TO ISR ENERGY. RESEARCH REPORT NO. 3/1973.
O. Korosuo, and S. Sohlo. Feb 73, 20p
U.S. Sales Only.

Descriptors: (*Hadron-hadron interactions, *Inclusive interactions), Correlations, Energy, Gev range 10-100, Gev range 100-1000, Linear momentum, Two-body problem.

For abstract, see NSA 28 02, number 03798.

N73-27611/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SCATTERING OF 42 MEV ALPHA PARTICLES FROM COPPER-65.
W. M. Stewart, and K. K. Seth. Jul 73, 29p NASA-TN-D-7354, E-7404

Descriptors: *Alpha particles, *Angular distribution, *Copper isotopes, *Elastic scattering, *Inelastic scattering, Energy levels, Nuclear radiation spectroscopy, Nuclear reactions.

For abstract, see STAR 1118

N73-27612/3GA PC$3.00/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Physics.

LIST OF TECHNICAL REPORTS AND CONFERENCES ON PION RESEARCH.
Final Report.
K. Gotow, D. A. Jenkins, D. K. Anderson, M. Blecher, and R. Powers. Feb 73, 8p NASA-CR-132280
Contracts NGL-47-004-033, PROJ. 313177

Descriptors: *Nuclear physics, *Research projects, Lists, Literature, Nuclear research, Theses.

For abstract, see STAR 1118

N73-27613/1GA PC$3.25/MF$1.45
Rome Univ. (Italy). Inst. of Physics.
HADRON PAIR PRODUCTION BY ELECTRON-POSITRON COLLIDING BEAMS.
G. Barbiellini, F. Ceradini, M. Conversi, S. Dangelo, and G. Giannoli. 19 Dec 72, 21p NOTA-INTERNA-420
Subm-Submitted for Publication.

Descriptors: *Electron beams, *Hadrons, *Pair production, *Positron annihilation, *Scattering cross sections, Form factors, High energy interactions, Kaons, Pions, Vector dominance model.

For abstract, see STAR 1118

N73-27614/9GA PC$3.00/MF$1.45
Westfield Coll., London (England). Dept. of Physics.
FRAGMENTATION MODELS AND UNITARITY.
M. Teper. Jan 72, 17p
Subm-Sponsored by UK Sci. Res. Council.

Descriptors: *Diffraction, *Inelastic scattering, *Mathematical models, *Proton-proton reactions, Excitation, Fragmentation, Regge poles, Scattering cross sections, Unity.

For abstract, see STAR 1118

N73-27615/6GA PC$4.25/MF$1.45
Westfield Coll., London (England). Dept. of Physics.
PROTON-ANTIPROTON ANNIHILATIONS: A CRITIQUE OF THE UNCORRELATED JET MODEL.
M. Teper. Jan 73, 43p
Subm-Sponsored by UK Sci. Res. Council.

Descriptors: *Annihilation reactions, *Antiprotons, *Integral equations, *Mathematical models, *Protons, Elastic scattering, High energy interactions, Proton-proton reactions, Scattering cross sections.

For abstract, see STAR 1118

N73-27616/4GA PC$3.00/MF$1.45
Westfield Coll., London (England). Dept. of Physics.
NON-DIFFRACTIVE MODELS WITH N SQUARED APPROXIMATE 1/S.
M. Teper. 1972, 11p
Subm-Sponsored by UK Sci. Res. Council.

Descriptors: *Diffraction, *High energy interactions, *Mathematical models, *Particle production, Decay, Fragmentation, Meson resonances, Pomeranchuk theorem, Predictions, Regge poles, Scattering cross sections.

For abstract, see STAR 1118

ORNL-TM-4216/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
IS THERE STILL A NITROGEN CROSS-SECTION DISCREPANCY.
F. G. Perey, and J. K. Dickens. May 73, 12p
Contract W-7405-eng-26

Descriptors: (*Neutron transport, *Cross sections), (*Nitrogen 14, *Neutron reactions), (*Air, Neutron transport), Errors, Fast neutrons, Mev range 10-100, Reliability.

For abstract, see NSA 28 02, number 04022.

ORNL-4803/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
TUNGSTEN NEUTRON ELASTIC- AND INELASTIC-SCATTERING CROSS SECTIONS FROM 4.34 TO 8.56 MEV.
W. E. Kinney, and F. G. Perey. May 73, 39p
Contract W-7405-eng-26

Descriptors: (*Tungsten, Neutron reactions), (*Neutron reactions, *Elastic scattering), Angular distribution, Differential cross sections, Evaporation model, Inelastic scattering, Mev range 01-10, Nuclear temperature.

For abstract, see NSA 28 03, number 07017.

ORO-2504-206/GA PC$4.75/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
DIFFERENTIAL CROSS SECTIONS FOR ELASTIC PI EXP + P SCATTERING BETWEEN 1.2 AND 2.3 GEV/C. TECHNICAL REPORT NO. 73-104.
K. Abe, B. A. Barnett, J. H. Goldman, A. T. Laasanen, and P. H. Steinberg. Apr 73, 55p

Descriptors: (*Pion-proton interactions, *Differential cross sections), (*Protons, *Pion beams), Angular distribution, Elastic scattering, Gev range 01-10, Legendre polynomials, Linear momentum, Total cross sections.

For abstract, see NSA 28 03, number 06737.

ORO-4317-18/GA PC$3.25/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
BOUNDARY-CONDITION APPROACH TO THREE-PARTICLE FINAL STATES. TECHNICAL REPORT NO. 73-106.
D. D. Brayshaw. Apr 73, 25p

Descriptors: (*Three-body problem, *Wave functions), (*Elementary particles, Three-body problem), Boundary conditions, Final-state interactions, Integral equations, S matrix, Scattering.

For abstract, see NSA 28 02, number 03960.

ORO-4317-19/GA PC$3.00/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
N--D BACKWARD SCATTERING AND VIRTUAL STATES OF THE TRINUCLEON. TECHNICAL REPORT NO. 73-109.
T. J. Brady. Apr 73, 8p
Contract AT(40-1)-4317

Descriptors: (*Deuterium, Nucleon reactions), (*Nucleon reactions, *Elastic scattering), (*Trineutrons, *Virtual states), Cross sections, Excitation functions, Kev range 100-1000, Mev range 01-10, Peaks, Phase shift.

For abstract, see NSA 28 02, number 04033.

ORO-4317-20/GA PC$3.00/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
NEW FACTORIZED OFF-SHELL PRESCRIPTION FOR THE DWIA IN KNOCKOUT REACTIONS. TECHNICAL REPORT NO. 73-111.
E. F. Redish. May 73, 12p

Descriptors: (*Knock-out reactions, *Nuclear reaction kinetics), Distorted wave theory, Dwba, Impulse approximation, S matrix.

For abstract, see NSA 28 03, number 07059.

RLO-1388-198/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
ACCELERATOR PRODUCTION OF EXP 8 B NEUTRINOS.
R. E. Marrs, D. Bodansky, and E. G. Adelberger. 1973, 12p

Descriptors: (*Lithium 6, *Helium 3 reactions), (*Helium 3 beams, *Stripping), Boron 8, Excitation functions, Mev range 01-10, Mev range 10-100, Neutrons, Transfer reactions.

For abstract, see NSA 28 02, number 04050.

RLO-1388-201/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
MEASUREMENT AND MICROSCOPIC ANALYSIS OF THE EXP 6 LI(EXP 6 LI, EXP 6 LI*(3.56)) EXP 6 LI*(3.56) AND THE EXP 6 LI(EXP 6 LI, EXP 6 HE) EXP 6 BE REACTIONS.
W. R. Wharton, J. G. Cramer, D. H. Wilkinson, J. R. Calarco, and K. G. Nair. 1972, 11p

Descriptors: (*Lithium 6, Lithium 6 reactions), (*Lithium 6 reactions, *Charge-exchange reactions), Angular distribution, Differential cross sections, Excitation functions, Inelastic scattering, Mev range 10-100.

For abstract, see NSA 28 02, number 04051.

RLO-1388-203/GA PC$3.00/MF$1.45
Washington Univ., Seattle.
EVIDENCE FOR TWO-NEUTRON EXCHANGE IN THE ELASTIC AND INELASTIC SCATTERING OF EXP 18 O BY EXP 16 O.
W. N. Reisdorf, P. H. Lau, and R. Vandenbosch. 1972, 10p

Descriptors: (*Oxygen 16, *Oxygen 18 reactions), Baryon-exchange models, Cross sections, Elastic scattering, Neutrons.

For abstract, see NSA 28 02, number 04052.

RLO-1388-204/GA PC$3.00/MF$1.45
Washington Univ., Seattle.
MICROSCOPIC CALCULATION OF FISSION FRAGMENT ANISOTROPIES FOR NUCLEI EXHIBITING A DOUBLE BARRIER.
R. Vandenbosch. 1972, 19p

Descriptors: (*Fission fragments, *Angular distribution), (*Fission isomers, *Moment of inertia), Anisotropy, Nuclear potential, Potential energy.

For abstract, see NSA 28 02, number 04224.

RLO-1388-640/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
ELECTROMAGNETIC PARITY VIOLATION FOR HADRONS.
E. M. Henley, A. H. Huffman, and D. U. L. Yu. 1972, 9p

Descriptors: (*P invariance, *Electromagnetic interactions), (*Hadrons, Electromagnetic interactions), Asymmetry, Differential cross sections, Elastic scattering, Electron-proton interactions, Gev range 10-100, Photons, Polarization, Virtual particles.

For abstract, see NSA 28 02, number 03951.

RLO-1388-643/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Physics. Los Alamos Scientific Lab., N. Mex.
EXCHANGE EFFECTS IN NUCLEAR PARITY-VIOLATIONS.
E. M. Henley. Oct 72, 12p

Descriptors: (*Rho-765 resonances, *Decay), (*Omega-784 resonances, Decay), (*A1-1070 resonances, Decay), Coupling, Diagrams, Emission, Obe model, P invariance, Photons, Pions.

For abstract, see NSA 28 02, number 03952.

RLO-1388-650/GA PC$4.50/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
OFF-MASS SHELL PARITY-VIOLATING PION--NUCLEON INTERACTION.
E. M. Henley, T. E. Keliher, W. J. Pardee, and D. U. L. Yu. 1973, 48p

Descriptors: (*Pion-nucleon interactions, *P invariance), Cabibbo angle, Coupling, Mass, Nucleons, Pions, Renormalization.

For abstract, see NSA 28 02, number 03920.

RT/FI-(72)55/GA PC$4.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
INTERPRETATION OF THE RESULTS OF UNFOLDING OF NEUTRON SPECTRA OBTAINED WITH SPECTRA CODE.
B. Arcipiani. 20 Dec 72, 51p
In Italian. U.S. Sales Only.

Descriptors: (*Neutron spectra, *Spectra unfolding), (*Computer codes, *S codes), Kernels, Programming.

For abstract, see NSA 28 03, number 05736.

SU-4205-11/GA PC$3.00/MF$1.45
Syracuse Univ., N. Y. Dept. Of Physics.
SU(3) BREAKING AND PARTICLE PRODUCTION.
R. F. Amann, and M. L. Blackmon. Dec 72, 13p
COO-3533-11

Descriptors: (*Kaons neutral short-lived, *Decay), (*Eta mesons, Decay), Electromagnetic interactions, Emission, F-1260 resonances, Particle production, Photons, Pions minus, Pions plus, Pomeranchuk particles, Strong interactions, Su-3 groups, Symmetry breaking, Weak interactions.

For abstract, see NSA 28 03, number 06812.

SU-4205-262/GA PC$3.00/MF$1.45
Syracuse Univ., N. Y. Dept. Of Physics.
BOUNDS ON THE MOMENTS OF ABSORPTIVE PARTS OF ELASTIC SCATTERING AMPLITUDES.
A. P. Balachandran, M. L. Blackmon, and C. Sigaud. Nov 72, 14p NYO-3533-262

Descriptors: (*Pion-pion interactions, *Scattering amplitudes), (*Pion-nucleon interactions, Scattering amplitudes), Absorption, Boundary conditions, Elastic scattering, Integrals.

For abstract, see NSA 28 03, number 06825.

UCID-16245/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
EXISTENCE AND UNIQUENESS OF SOLUTIONS FOR THE WEIGHTED CENTRAL DIFFERENCE APPROXIMATIONS FOR THE NEUTRON TRANSPORT EQUATION.
N. K. Madsen. Mar 73, 15p
Contract W-7405-eng-48

Descriptors: (*Boltzmann equation, *Analytical solution), Discrete ordinate method, Neutron transport theory, Series expansion.

For abstract, see NSA 28 02, number 04023.

WAPD-TM-1073/GA PC$3.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Bettis Atomic Power Div.
TOTAL CROSS SECTION MEASUREMENTS WITH A EXP 252 CF TIME-OF-FLIGHT SPECTROMETER. LWBR DEVELOPMENT PROGRAM.
L. Green, and J. A. Mitchell. Apr 73, 29p
Contract AT-11-1-Gen-14

Descriptors: (*Carbon, *Neutron reactions), (*Thorium 232, Neutron reactions), (*Lead, Neutron reactions), (*Niobium 93, Neutron reactions), Cadmium, Chromium, Fast neutrons, Hafnium, Mev range 01-10, Mev range 100-1000, Nickel, Total cross sections, Uranium 233, Uranium 235, Zirconium, Zirconium 90, Zirconium 92.

For abstract, see NSA 28 03, number 07000.

20I. Plasma Physics

AD-767 220/7GA PC$3.00/MF$1.45
Florida Univ Gainesville
A STUDY OF ELECTRODELESS ARC DISCHARGE USING ARGON, NITROGEN, AND AIR.
Final rept. Jan 72-Mar 73,
Dennis R. Keefer. Sep 73, 47p AEDC-TR-73-143
Contract F40600-72-C-0005

Descriptors: (*Electric arcs, Efficiency), (*Plasma generators, Electric arcs), Axially symmetric flow, Enthalpy, Argon, Nitrogen, Air, Thermal conductivity.

A study of the bluff-body stabilized electrodless arc was undertaken to extend the operation to greater mass flow rates and power input. A small arc chamber, operating at a frequency of 3.5 MHz, was operated with mass flows up to 1.026 gm/sec of argon at atmospheric pressure with a power input of 6.79 KW. Under these conditions a plasma bulk temperature of 2305K was obtained with a heating efficiency of 18%. It was found that heating efficiency increased with chamber pressure, but bulk temperature depends primarily upon the power input. A larger arc chamber was designed for a nominal power input of 200 KW at a frequency of 377 MHz. This chamber was operated at mass flow rates up to 2.4 gm/sec of argon at a pressure of two atmospheres. A plasma bulk temperature of 5856K was obtained at a power input of 76KW. Attempted operation using air as a working fluid was unsuccessful at pressures in excess of 2/3 atmosphere due to inefficient coupling to the arc plasma. (Author)

AD-767 449/2GA Reprint
Michigan Univ Ann Arbor Dept of Nuclear Engineering
LIGHT SCATTERING FROM AN EXPLODED LITHIUM WIRE PLASMA,
T. A. Leonard, and D. R. Bach. 31 Jul 72, 12p
AFOSR-TR-73-1726
Grant AF-AFOSR-1693-69
Availability: Pub. in the Jnl. of Applied Physics, v44 n6 p2555-2565 Jun 73.

Descriptors: (*Plasma medium, Exploding wires), Lithium, Light transmission, Electron density, Lasers, High-speed photography.
Identifiers: Q switched lasers, Ruby lasers, Laser beams, *Light scattering, *Plasma diagnostics, Emission spectra.

A thin lithium wire was extruded and exploded in vacuum and the resulting plasma was studied during the first 2 microsec of the discharge. Included in the study were scattering of a Q-switched ruby laser beam, high-speed streak photographs showing the laser-plasma interaction, and time-resolved emission spectra. (Modified author abstract)

AD-767 523/4GA Reprint
Austin Research Associates Inc Tex
STABILITY OF AN UNNEUTRALIZED RIGIDLY ROTATING ELECTRON BEAM,
H. Vernon Wong, M. Lee Sloan, James R. Thompson, and Adam T. Drobot. 25 Sep 72, 4p
AFOSR-TR-73-1744
Contract F44620-72-C-0071
Availability: Pub. in Physics of Fluids, v16 n6 p902-903 Jun 73.

Descriptors: (*Electron beams, Stability), Magnetic fields, Distribution functions.

An unneutralized rigidly rotating electron beam is absolutely stable if the distribution function is a monotonically decreasing function of (H sub 0)-(omega sub L)(L sub z) and if (rho sub B)(omega sub 1)/c)<1, where (H sub 0) and (L sub z) are the single-particle energy and canonical angular momentum, (omega sub L) is the angular velocity, and (rho sub B) is the radius of an enclosing infinitely conducting cylindrical wall. (Author)

AD-767 599/4GA PC$3.75/MF$1.45
Calspan Corp Buffalo N Y
TWO-DIMENSIONAL EFFECTS IN LASER-SOLID SIMULATION STUDIES.
Final rept. 1 Jun 71-31 Jul 73,
J. W. Daiber, H. M. Thompson, and R. G. Rehm. Aug 73, 35p Rept no. CALSPAN-WG-5003-A-2
AFOSR-TR-73-1700
Contract F44620-71-C-0102

Descriptors: (*Plasma medium, Lasers), Hydrogen, Solids, Heating, Gas flow, High-speed photography, Shock waves.
Identifiers: *Laser produced plasmas, Nuclear fusion, Ruby lasers, Laser heating, Laser beams.

The objective of this program is to study the two-dimensional wave motions induced in a target by high-power laser radiation. For these studies the target is an axisymmetric, supersonic free-jet of hydrogen gas which is laser irradiated on axis. The transparency of the target permits luminosity and schilieren streak photography of the forward-facing waves that propagate into the high-pressure plenum. Measurements of the axial and lateral luminous plasma growth during the laser pulse and of the axial shock wave growth after the pulse have been obtained for hydrogen gas targets over a range of plenum pressures and laser powers. It has been found that the axial luminous-front growth can be predicted by a deflagration model; in this model the velocity scales with the parameter absorbed power divided by gas reservoir pressure to the one-third power. The shock-wave velocity along the axis of symmetry also appears to scale with this parameter. An explanation for this latter result has been proposed. (Author)

CONF-730315-11/GA PC$3.00/MF$1.45
Princeton Univ., N. J.
CONFINEMENT OF PARTICLES AND ENERGY IN TOKAMAK PLASMAS.
E. Hinnov, D. Dimock, L. C. Johnson, and E. Meservey. 1973, 4p
Contract AT(11-1)-3073

Descriptors: (*Plasma, *Confinement), (*Tokamak model st, Confinement), Electric currents, Joule heating.

For abstract, see NSA 28 02, number 04296.

CONF-730315-13/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
INTERNAL RING EXPERIMENTS AT PRINCETON PLASMA PHYSICS LABORATORY.
S. Yoshikawa. 7p
Contract AT(11-1)-3073

Descriptors: (*Fm devices, *Confinement), (*Plasma, Confinement), Electron density, Electron temperature, Magnetic fields.

For abstract, see NSA 28 02, number 04297.

CONF-730315-14/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
LOCAL MEASUREMENTS OF MHD STABILITY PROPERTIES IN THE ST TOKAMAK.
F. C. Jobes, and J. C. Hosea. 1972, 4p
Contract AT(11-1)-3073

Descriptors: (*Plasma diagnostics, *Ion beams), (*Tokamak model st, Plasma diagnostics), Magnetohydrodynamics, Plasma instability, Thallium.

For abstract, see NSA 28 02, number 04315.

COO-2180-1/GA PC$3.00/MF$1.45
Brigham Young Univ., Provo, Utah (Usa). Dept. Of Physics and Astronomy.
STUDIES OF CHARGED-PARTICLE DISTRIBUTIONS IN AN ELECTROSTATIC CONFINEMENT SYSTEM. PROGRESS REPORT, NOVEMBER 1, 1971--JULY 31, 1972.
A. L. Gardner. 1972, 18p
Contract AT(11-1)-2180

Descriptors: (*Plasma, *Confinement), Cavity resonators, Distribution, Electrostatics, Ion sources, Resonance.

For abstract, see NSA 28 03, number 07100.

COO-2233-2/GA PC$6.25/MF$1.45
Columbia Univ., New York. Plasma Lab.
INFRARED EMISSION AND 10.6 MU M. LASER SCATTERING FROM THE DENSE PLASMA FOCUS.
R. S. Post. 1973, 83p
Contract AT(11-1)-2233

Descriptors: (*Plasma diagnostics, *Infrared radiation), (*Plasma focus, Plasma diagnostics), Bremsstrahlung, Carbon dioxide, Emission spectra, Laser radiation, Plasma density, Scattering.

For abstract, see NSA 28 02, number 04316.

EUR-CEA-FC-669/GA PC$12.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
ABSORPTION OF MAGNETOACOUSTIC WAVES BY ION--ION COLLISIONS IN A DOUBLE ION PLASMA.
F. Alvarez de Toledo. Nov 72, 196p
In French. U.S. Sales Only.

Descriptors: (*Inhomogeneous plasma, *Heating), (*Stator-b, Heating), Confinement, Deuterium, Hydrogen, Hydromagnetic waves, Ion temperature, Ions, Magnetoacoustics, Pinch devices, Plasma density, Tori, Wave propagation.

For abstract, see NSA 28 03, number 07101.

EUR-CEA-FC-679/GA PC$3.75/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
DETERMINATION OF THE DENSITY, AND ENERGY SPECTRUM OF THE IONS OF A PLEIADE PLASMA USING AN OPTICAL DOPPLER SHIFT METHOD.
R. Geller, W. Hess, M. Hesse, B. Jacquot, and C. Jacquot. Jan 73, 31p
In French. U.S. Sales Only.

Descriptors: (*Pleiade device, Plasma diagnostics), (*Plasma diagnostics, *Spectrometers), Balmer lines, Calibration, Counting techniques, Doppler effect, Energy spectra, Ion density, Ions, Performance, Photons.

For abstract, see NSA 28 03, number 07106.

JPRS-59883/GA PC$3.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
ANOMALOUS NONLINEAR DISSIPATION OF HIGH-FREQUENCY RADIO WAVES IN PLASMA,
V. P. Silin. 24 Aug 73, 54p
Trans. of Uspekhi Fizicheskikh Nauk (USSR) n4 p625-654 1972.

Descriptors: (*Plasmas(Physics), *Radio waves), Turbulence, Stability, Dissipation, Translations, USSR, High frequencies.
Identifiers: Parametric instabilities.

The effect of electromagnetic radiation on plasma is of interest from the viewpoint of the necessity of understanding a whole series of physical phenomena. These phenomena include the propagation and absorption of electromagnetic waves in the ionosphere and plasmas of outer space, the heating of plasmas in devices designed for solving problems of controlled thermonuclear synthesis and employing radio or laser frequency ranges of electromagnetic radiation, as well as phenomena in which the possibility appears for using plasmas to convert different waves. Numerous investigators have studied rather well the effect of weak waves on plasmas when such phenomena correspond to linear electrodynamics. Less studied, but at the present time being intensively studied, is the effect on plasma of high-power electromagnetic radiation when the possibility arises for a whole series of different nonlinear phenomena. The present report is devoted to one of these groups of nonlinear phenomena in plasmas for which it is characteristic to have the onset of an anomalous high-frequency resistance produced by the resonance parametric effect of powerful radiation leading to the development of perturbations in plasmas and to a turbulent state.

JPRS-59885/GA PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
WAVES, INSTABILITIES AND ANOMALOUS DISSIPATION OF A PARAMETRIC PLASMA (IN THE STRONG ELECTROMAGNETIC FIELD OF A PUMPING WAVE),
V. P. Silin. 24 Aug 73, 32p
Trans. of mono. Voly, Neustoichivosti i Anomalnaya Dissipatsiya Parametricheskoi Plazmy (V Silnom Elektromagnitnom Pole Volny Nakachki), Moscow, Preprint 62 1973 52p.

Descriptors: (*Plasma oscillations, Electromagnetic fields), Langmuir probes, Logitudinal waves, Translations, USSR.
Identifiers: Parametric instabilities, Ion acoustic waves.

Today it is clear that in the transmission of radiation energy to a plasma, an important role is played by the processes of the effect of the external radiation in which the external pumping wave is converted in one way or another into plasma waves which then transmit their energy to the plasma particles. In the report the discussion is of the nonlinear processes of exciting waves in a plasma.

JUL-757-TP/GA PC$4.00/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Technische Physik.
VALID LIMITS OF CENTRAL MODEL CONCEPTION OF CS-PLASMA IN IONIZED THERMIONIC DIODES.
H. A. Claassen, and C. S. Helrich. Aug 72, 47p
In German. U.S. Sales Only.

Descriptors: (*Thermionic converters, *Operation), Cesium, Electrodes, Mathematical models, Plasma, Temperature dependence, Work functions.

For abstract, see NSA 28 02, number 02483.

N-73-10700/GA PC$7.60/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
MONTE CARLO SIMULATION OF NONLINEAR RADIATION INDUCED PLASMAS.
B. S. H. Wang. May 72, 167p NASA-CR-128405, UIUCDCS-R-27-519
Contract AT(11-1)-2007

Descriptors: (*Plasma production, *Alpha particles), (*Plasma simulation, *Monte carlo method), Distribution functions, Electrons, Irradiation, Iterative methods, Nonlinear problems.

For abstract, see NSA 28 02, number 04336.

N-73-10703/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
HEAVY ION PLASMA CONFINEMENT IN AN RF QUADRUPOLE TRAP.
J. P. Schermann, and F. G. Major. Jul 71, 35p NASA-TM-X-65719, X-524-71-343

Descriptors: (*Plasma, *Confinement), (*Magnetic traps, Confinement), Iodine, Ions, Mercury, Quadrupoles, Radiowave radiation, Thallium iodides.

For abstract, see NSA 28 02, number 04298.

N-73-11741/GA PC$7.60/MF$1.45
Iowa Univ., Iowa City. Dept. Of Physics and Astronomy.
STRONGLY MAGNETIZED CLASSICAL PLASMA MODELS.
D. Montgomery. 1972, 157p NASA-CR-129177

Descriptors: (*Plasma, *Guiding-center approximation), Boltzmann-vlasov equation, Larmor radius, Magnetic fields, Statistics, Two-dimensional calculations.

For abstract, see NSA 28 02, number 04337.

N-73-12777/GA PC$7.60/MF$1.45
Stanford Univ., Calif. Inst. For Plasma Research.
LAGRANGIAN METHODS IN THE ANALYSIS OF NONLINEAR WAVE INTERACTIONS IN PLASMA.
J. J. Galloway. Oct 72, 172p NASA-CR-129597, SU-IPR-488

Descriptors: (*Plasma waves, *Nonlinear problems), Interactions, Lagrange equations, Plasma.

For abstract, see NSA 28 02, number 04380.

N-73-12778/GA PC$5.45/MF$1.45
Stanford Univ., Calif. Inst. For Plasma Research.
LOW-FREQUENCY MACROSCOPIC INSTABILITIES OF FULLY IONIZED MAGNETOPLASMA.
T. D. Rognlien. Oct 72, 100p NASA-CR-129517, SU-IPR-487

Descriptors: (*Plasma instability, *Magnetic fields), Collisions, Electrons, Ionization, Ions, Plasma waves, Reflection.

For abstract, see NSA 28 02, number 04352.

NP-19730/GA PC$3.00/MF$1.45
Stichting voor Fundamenteel Onderzoek der Materie, Jutphaas (Netherlands). Instituut voor Plasma-Fysica.
HEATING OF A TOKAMAK PLASMA TO IGNITION TEMPERATURES BY CURRENT-DRIVEN TURBULENCE. RIJNHUIZEN REPORT 73-76.
H. de Kluiver. Mar 73, 8p
U.S. Sales Only.

Descriptors: (*Hot plasma, *Heating), (*Tokamak devices, Heating), Electric currents, Electrons, Nonlinear problems, Plasma waves, Scaling laws, Turbulence.

For abstract, see NSA 28 02, number 04299.

NP-19734/GA PC$3.00/MF$1.45
Stichting voor Fundamenteel Onderzoek der Materie, Jutphaas (Netherlands). Instituut voor Plasma-Fysica.
PROPOSAL FOR PREFERENTIAL SUPPORT. PROJECT: TURBULENT HEATING OF A TOROIDALLY CONFINED PLASMA BY HIGH ELECTRIC FIELDS. RIJNHUIZEN REPORT 73-75.
H. W. Piekaar, B. de Groot, and H. de Kluiver.
Mar 73, 14p
U.S. Sales Only.

Descriptors: (*Plasma, *Heating), Electric fields, Magnetic fields, Tori, Turbulence.

For abstract, see NSA 28 02, number 04300.

N73-27430/0GA PC$4.75/MF$1.45
Defence Research Establishment Valcartier (Quebec).
INTERNAL STRUCTURE OF TEA LASER DISCHARGES.
T. Tricker. Apr 73, 51p DREV-TN-2061/73

Descriptors: *Carbon dioxide lasers, *Coherent radiation, *Laser outputs, *Plasma dynamics, Computer programs, Ionization coefficients, Numerical analysis.

For abstract, see STAR 1118

N73-27623/6GA PC$3.00/MF$1.45
California Univ., Berkeley.
PLASMA KINETIC THEORY.
Final Report.
A. N. Kaufman. 7 Jun 73, 5p NASA-CR-132785
Contracts NGR-05-003-220, NGL-05-003-220

Descriptors: *Kinetic theory, *Plasma dynamics, *Plasma interactions, Plasma oscillations, Plasma turbulence.

For abstract, see STAR 1118

N73-27624/8GA PC$3.25/MF$1.45
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
ELECTRIC FIELD CORRECTIONS IN THE GUIDANCE-CENTER PLASMA.
G. Joyce, D. Montgomery, and M. Emery. Apr 73, 22p NASA-CR-133410, U-OF-IOWA-73-12
Contracts NGL-16-001-043, AT(11-1)-2059

Descriptors: *Autocorrelation, *Electric fields, *Plasma physics, Numerical analysis, Plasma diagnostics.

For abstract, see STAR 1118

N73-27626/3GA PC$3.25/MF$1.45
Lausanne Univ. (Switzerland). Centre de Recherches en Physique des Plasmas.
SIMULATION OF BELT PINCH EXPERIMENTS INCLUDING THE CIRCUIT EQUATIONS.
D. W. Ignat, and F. Hofmann. Mar 73, 25p LRP-61/73
Subm-Sponsored by the Swiss Natl. Sci. Found.

Descriptors: *Computerized simulation, *Electric fields, *Magnetohydrodynamics, *Mathematical models, *Plasma interactions, Computerized simulation, Magnetic fields, Mathematical models, Plasma cylinders, Theta pinch.

For abstract, see STAR 1118

N73-27676/8GA PC$5.25/MF$1.45
Radio Corp. of America, Princeton, N.J.
GAN FOR LED APPLICATIONS.
Final Report, 18 Apr. 1972 - 17 Apr. 1973.
J. I. Pankove. May 73, 64p NASA-CR-132263, PRRL-73-CR-32
Contract NAS1-11553

Descriptors: *Crystal growth, *Diodes, *Gallium compounds, *Nitrides, *Semiconductors (Materials), Additives, Electroluminescence, Luminous intensity, Single crystals, Temperature effects.

For abstract, see STAR 1118

N73-28091/9GA PC$3.25/MF$1.45
Fom-Instituut voor Plasmafysica, Jutphaas (Netherlands).
COMPUTATIONS CONCERNING A MULTIPACTOR DISCHARGE.
H. Bremmer. Feb 73, 24p REPT-73-74
Subm-Sponsored in Part by Neth. Organ. For Pure Sci. Res. (Zwo) and Euratom.

Descriptors: *Electron density (Concentration), *Multipactor discharges, *Secondary emission, Alternating current, Consistency, Distribution functions, Electrodes, Liouville equations, Time dependence.

For abstract, see STAR 1119

N73-28180/0GA PC$3.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Continuum Electromechanics Group.
RESEARCH IN ELECTROHYDRODYNAMICS.
Final Report.
1 Jun 73, 17p NASA-CR-133456
Contract NGL-22-009-014

Descriptors: *Documentation, *Electrohydrodynamics, *Research, Feedback control, Hydrodynamics, Magnetohydrodynamics.

For abstract, see STAR 1119

N73-28560/3GA PC$3.50/MF$1.45
Institut Franco-Allemand de Recherches, St. Louis (France).
PRELIMINARY STUDIES OF THE ELECTRIC DISCHARGE IN A FLOWING GAS PHASE PREPARATOIRE A L'ETUDE DE LA DECHARGE ELECTRIQUE DANS UN GAZ EN MOUVEMENT.
B. C. Jaeggy, R. Joeckle, and G. Stern. 11 Aug 72, 26p ISL-20/72
Contract DRME-71/34.337
Language in French.

Descriptors: *Carbon dioxide lasers, *Electric discharges, *Molecular relaxation, *Supersonic wind tunnels, Bibliographies, Gas flow, Plasma diagnostics.

For abstract, see STAR 1119

N73-28693/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHARACTERISTICS AND PERFORMANCE OF A SUPERCONDUCTING BUMPY-TORUS MAGNET FACILITY FOR PLASMA RESEARCH.
J. R. Roth, A. D. Holmes, T. A. Keller, and W. M. Krawczonek. Aug 73, 58p NASA-TN-D-7353, E-7225

Descriptors: *Plasma control, *Research facilities, *Superconducting magnets, *Thermonuclear power generation, *Toroidal discharge, Fusion, Magnetic fields, Performance.

For abstract, see STAR 1119

N73-28696/5GA PC$17.25/MF$1.45
Innsbruck Univ. (Austria). Inst. fuer Theoretische Physik.
LITERATURE SURVEY ON PLASMA INSTABILITIES COVERING 1971 PUBLICATIONS. PART 2: ABSTRACTS.
G. Auer, F. Cap, and P. Hukla. 31 Dec 72, 304p
UNICP-SR-95-PT-2

Descriptors: *Bibliographies, *Magnetohydrodynamic stability, *Plasma dynamics, Abstracts, Indexes (Documentation), Literature.

For abstract, see STAR 1119

N73-28702/1GA PC$3.50/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
PLASMA STREAM IN AN INHOMOGENEOUS TRANSVERSE MAGNETIC FIELD.
E. T. Karlson. Mar 73, 30p TRITA-EPP-73-08

Descriptors: *Magnetic fields, *Plasma interactions, Electric fields, Magnetohydrodynamics, Propagation velocity, Streams, Transverse waves.

For abstract, see STAR 1119

ORNL-TM-4153/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
HIGH- BETA BEHAVIOR IN A CANTED MIRROR.
R. A. Dandl, H. O. Eason, A. C. England, and J. C. Sprott. May 73, 34p
Contract W-7405-eng-26

Descriptors: (*High-beta plasma, *Confinement), (*Magnetic mirrors, Confinement), Configuration, Cyclotron resonance, Electron temperature, Energy losses, Hot plasma.

For abstract, see NSA 28 02, number 04301.

ORO-2598-6/GA PC$3.00/MF$1.45
Tennessee Univ., Knoxville. Dept. Of Physics.
INSTABILITIES DUE TO ANISOTROPIC VELOCITY DISTRIBUTIONS. PROGRESS REPORT, JUNE 1, 1972--JUNE 1, 1973.
E. G. Harris. 1973, 8p
Contract AT(40-1)-2598

Descriptors: (*Plasma instability, *Research programs), Anisotropy, Distribution, Reviews, Velocity.

For abstract, see NSA 28 03, number 07150.

ORO-4338-2/GA PC$3.50/MF$1.45
University of South Florida, Tampa (Usa). Dept. Of Physics.
LINEAR ION ACOUSTIC WAVES IN A DENSITY GRADIENT.
D. Jones. 15 Apr 73, 28p
Contract AT(40-1)-4338

Descriptors: (*Ion acoustic waves, *Collisionless plasma), Damping, Electric discharges, Plasma density, Wave propagation.

For abstract, see NSA 28 02, number 04381.

PATENT-3 728 217/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
BUMPY TORUS PLASMA CONFINEMENT DEVICE.
Patent,
Raphael A. Dandl. Filed 5 Jun 72, patented 17 Apr 73, 8p PAT-APPL-259 984
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Plasma control, *Patents), Toroids, Magnetic cores, Magnetohydrodynamics, Nuclear fusion.
Identifiers: PAT-CL-176-3.

The patent concerns a bumpy torus which is made magnetohydrodynamically stable by maintaining in each bump of the torus, and outside the toroidal plasma, a high pressure, relativistic electron plasma ring which is itself stabilized by cold plasma line tying.

PATENT-3 733 248/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
PLASMA CONTROL BY FEEDBACK.
Patent,
Hans W. Hendel, Francis F. Chen, Tsu-Kai Chu, Harold P. Furth, and Francis W. Perkins. Filed 15 Feb 72, patented 15 May 73, 11p PAT-APPL-226 556
Previously filed as PAT-APPL-12 309, 18 Feb 70.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Plasma control, *Patents), Feedback control, Nuclear fusion.
Identifiers: PAT-CL-176-3, Plasma instabilities.

The patent describes a method and apparatus for controlling instabilities in a magnetically confined plasma by applying feedback to the particle density, momentum, energy, and/or potential of the plasma, for maximizing the density of the same and/or for providing means for confining the plasma for long periods of time and/or at high temperatures. More particularly, the invention contemplates feedback control of the plasma by selectively injecting particles, momentum or energy into the plasma. In another aspect, the invention contemplates feedback control of the magnetic confining field.

PATENT-3 736 539/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
MOMENT-FREE TOROIDAL MAGNET DESIGN.
Patent,
Joseph File, Robert G. Mills, George V. Sheffield, and Peter Bonanos. Filed 18 Apr 72, patented 29 May 73, 8p PAT-APPL-245 147
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Superconducting magnets, *Patents), (*Plasma control, *Nuclear fusion), Toroids, Thermonuclear reactions.
Identifiers: PAT-CL-335-216.

The patent describes an apparatus for confining a high temperature plasma column having a large cross-section in a strong magnetic field for increasing the plasma confinement time. The apparatus, comprises a large superconducting moment-free toridal magnet having coil strands in pure-tension that are self-supported on an inner cylindrical member. In one embodiment, two examples are given for a DT reactor and a catalyzed DD fusion reactor.

SFB-MHD-6/GA PC$4.00/MF$1.45
Technische Universitaet, Berlin (West Germany).
ANALYTICAL STUDY OF UNCOMPENSATED DC MHD CONVERTERS WITH REGARD TO THE LONGITUDINAL END EFFECT.
T. Schulz. Jun 72, 36p
In German. U.S. Sales Only.

Descriptors: (*Mhd generators, *Efficiency), Direct current, Magnetic reynolds number.

For abstract, see NSA 28 02, number 02490.

SFB-MHD-7/GA PC$3.50/MF$1.45
Technische Universitaet, Berlin (West Germany).
COMPARISON OF THE LONGITUDINAL END EFFECTS OF CONSTANT AND TRAVELING FIELD MHD CONVERTERS.
T. Schulz. Jun 72, 29p
In German. U.S. Sales Only.

Descriptors: (*Mhd generators, *Performance), Magnetic fields, Magnetohydrodynamics.

For abstract, see NSA 28 02, number 02491.

TRITA-EPP-72-31/GA PC$4.75/MF$1.45
Kungliga Tekniska Hogskolan, Stockholm (Sweden).
EXPERIMENTAL INVESTIGATION OF AN IONIZING WAVE IN A COAXIAL PLASMA GUN.
I. Axnaes. Dec 72, 55p
U.S. Sales Only.

Descriptors: (*Plasma guns, *Ionization), Collisions, Dissociation, Electric fields, Electric probes, Electrons, Ions, Magnetic fields, Plasma density.

For abstract, see NSA 28 03, number 07120.

UCID-16264/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
CHARGE EXCHANGE AT THE SURFACE OF MIRROR-CONFINED PLASMAS.
T. K. Fowler. 10 May 73, 16p
Contract W-7405-eng-48

Descriptors: (*Magnetic mirrors, *Charge exchange), (*Plasma, *Confinement), Beam injection, Energy losses.

For abstract, see NSA 28 03, number 07102.

20J. Quantum Theory

AD-767 133/2GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON THE MAGNITUDE OF AN ADIABATIC INVARIANT IN QUANTUM MECHANICS.
Technical summary rept.,
Wolfgang Wasow. Jul 73, 22p Rept no. MRC-TSR-1345
Contract DA-31-124-ARO(D)-465

Descriptors: (*Quantum mechanics, Invariance), Differential equations, Hilbert space, Matrix algebra, Theorems.
Identifiers: Schrodinger equation.

The adiabatic invariant of quantum mechanics for a system with finitely many states is asymptotically calculated with particular attention to its dependence on the smoothness of the Hamiltonian. (Author)

AD-767 497/1GA Reprint
Princeton Univ N J Dept of Physics
NONUNIQUENESS OF CANONICAL FIELD QUANTIZATION IN RIEMANNIAN SPACE-TIME, TIME,
Stephen A. Fulling. 3 Nov 72, 15p AFOSR-TR-73-1884
Contract F44620-71-C-0108
Availability: Pub. in Physical Review D, v7 n10 p2850-2862, 15 May 73.

Descriptors: (*Field theory, Quantum mechanics), Relativity theory, Gravity, Tensor analysis.
Identifiers: Riemann surfaces, Minkowski space, Gravitational fields, *Quantum field theory.

The author points out and discusses an ambiguity which arises in the quantum theory of fields when the background metric is not explicitly Minkowskian-in other words, when an external gravitational field, real or apparent, is present. a general theory of a canonical neutral scalar field in a static universe, including the construction of a Fock space, is presented. It is applied to a portion of two-dimensional flat space-time equipped with a non-Cartesian space-time coordinate system with respect to which the metric is nonetheless static. The resulting particle interpretation of the field is shown to be different from the standard one in special-relativistic free-field theory. (Modified author abstract)

COO-2271-11/GA PC$3.00/MF$1.45
Columbia Univ., New York. Columbia Univ., New York. Barnard Coll., New York.
SOME FUNCTIONAL INEQUALITIES, WITH APPLICATION TO GREENS' FUNCTIONS.
J. M. Luttinger, and R. Friedberg. (nd). 18p

Descriptors: (*Potential scattering, *Green function), (*Scattering lengths, Green function), Functionals, Mathematical operators, Schroedinger equation.

For abstract, see NSA 28 03, number 06870.

COO-2271-6/GA PC$5.75/MF$1.45
Columbia Univ., New York. Dept. Of Physics.
RENORMALIZATION METHOD: A DIFFERENT OUTLOOK, AND THE ENERGY-MOMENTUM TENSOR IN THE GPHI EXP 4 THEORY.
E. C. Poggio. 1973, 71p

Descriptors: (*Quantum field theory, *Renormalization), Bosons, Propagator, Tensors.

For abstract, see NSA 28 02, number 04464.

COO-2271-7/GA PC$4.75/MF$1.45
Columbia Univ., New York. Dept. Of Physics.
SHORT-DISTANCE BEHAVIOR OF A GPHI EXP 4 THEORY, AND CONFORMAL INVARIANT FOUR-POINT FUNCTIONS.
E. C. Poggio. 1973, 55p

Descriptors: (*Quantum field theory, *Interaction range), Conformal invariance, Eigenvalues, Interactions, Propagator, Vertex functions.

For abstract, see NSA 28 02, number 04465.

ITF-72-106-P/GA PC$3.25/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
MOTION OF A BORN-RIGID BODY IN GENERAL RELATIVITY.
S. P. Evtushenko. 1972, 23p
In Russian. U.S. Sales Only.

Descriptors: General relativity theory, Motion, Particles, Rotation.

For abstract, see NSA 28 02, number 04473.

ITF-72-116P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
RIGID BODY DYNAMICS IN SPECIAL RELATIVITY.
S. P. Evtushenko. 1972, 15p
In Russian. U.S. Sales Only.

Descriptors: Classical mechanics, Equations, Mption, Relativity theory, Sum rules.

For abstract, see NSA 28 02, number 05032.

ITF-72-156-E/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
CONSTRUCTION OF THE BOGOLIUBOV SCATTERING OPERATOR IN THE (P/SUP 2M/PHI) SUB 2 THEORY.
Yu. A. Semenov. 1972, 20p
U.S. Sales Only.

Descriptors: (*Scattering, *Mathematical operators), (*Quantum field theory, Scattering), Causality, Equations, Factorization, Functions, Unitarity.

For abstract, see NSA 28 03, number 06871.

ITF-72-173-E/GA PC$4.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
SOME TOPOLOGICAL PROPERTIES OF LANDAU CURVES.
V. Z. Enolsky. 1972, 36p
U.S. Sales Only.

Descriptors: Mandelstam representation, Mass, Scalars, Scattering amplitudes, Topology.

For abstract, see NSA 28 03 number 06872.

ITF-72-187-P/GA PC$3.25/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
EQUILIBRIUM FIGURES OF AN IDEAL ROTATING LIQUID IN THE POST-NEWTONIAN APPROXIMATION OF GENERAL RELATIVITY.
K. A. Piragas. 1972, 22p
In Russian. U.S. Sales Only.

Descriptors: (*Liquids, *Rotation), Equilibrium, Liapunov method, Mathematics, Relativistic range, Stability.

For abstract, see NSA 28 03, number 07720.

ITF-72-90-E/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
SENSITIVITY OF GRAVITATIONAL DETECTOR WITH PASSIVE TRANSDUCER.
V. B. Braginskii, and V. N. Rudenko. 1972, 13p
U.S. Sales Only.

Descriptors: (*Gravitational radiation, *Radiation detection), Radiation detectors, Sensitivity, Transducers.

For abstract, see NSA 28 03, number 07240.

ITF-73-11-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
NARIAI CONDITIONS IN GENERAL RELATIVITY THEORY.
V. I. Denisov. 1973, 8p
In Russian. U.S. Sales Only.

Descriptors: Energy, General relativity theory, Isotropy, Linear momentum, Surfaces, Tensors.

For abstract, see NSA 28 03, number 07241.

ITF-73-12-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
DISCONTINUITY OF METRIC TENSOR DERIVATIVES OF THE SPHERICALLY-SYMMETRICAL SPACE--TIME.
V. I. Denisov. 1973, 6p
In Russian. U.S. Sales Only.

Descriptors: (*Space-time, *Metrics), Einstein field equations, Spherical configuration, Symmetry, Tensors.

For abstract, see NSA 28 03, number 07242.

ITF-73-18-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
PROPERTIES OF THE WIGHTMAN FUNCTION IN THE NONPOLINOMIAL LAGRANGE FIELD THEORY.
U. S. Suyarov, and L. Sh. Hodzhaev. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Wightman field theory, *Propagator), (*Lagrangian field theory, Propagator).

For abstract, see NSA 28 03, number 07224.

ITF-73-25-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
REMOVABLE DISCONTINUITIES OF THE FIRST DERIVATIVES OF METRIC SPACE--TIME TENSOR.
V. I. Denisov. 1973, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Space-time, *Tensors), Coordinates, Einstein field equations, Metrics.

For abstract, see NSA 28 03, number 07243.

ITF-73-26-P/GA PC$3.50/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
STATIONARY FRAMES OF REFERENCE.
K. V. Usenko. 1973, 30p
In Russian. U.S. Sales Only.

Descriptors: (*General relativity theory, *Coordinates), Group theory, Mathematical space, Metrics, Motion, Surfaces, Three-dimensional calculations.

For abstract, see NSA 28 03, number 07244.

ITF-73-4-P/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
WIGHTMAN FIELD AS A CONCENTRATABLE FUNCTIONAL.
Yu. M. Lomsadze, I. Yu. Krivskii, and I. M. Shuba. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: Distribution, Functionals, Wightman field theory.

For abstract, see NSA 28 03, number 07223.

JEN-256/GA PC$6.00/MF$1.45
Junta de Energia Nuclear, Madrid (Spain).
REVIEW OF THE HELICITY FORMALISM.
F. Barreiro, M. Cerrada, and E. Fernandez. 1972, 77p
In Spanish. U.S. Sales Only.

Descriptors: (*Scattering amplitudes, *Helicity), Crossing symmetry, Lorentz invariance, Singularity, Spin, Symmetry.

For abstract, see NSA 28 03, number 06873.

JINR-P2-6965/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
CONFORMAL MOMENT OF MOMENTUM.
N. A. Chernikov, and N. S. Shavokhina. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Relativity theory, *Linear momentum), (*Quantum field theory, Linear momentum), Bosons, Conformal invariance, Fermions, Quantum mechanics, Scalar fields, Space-time, Spin, Universe.

For abstract, see NSA 28 02, number 04466.

JINR-P2-6968/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
DEFINITION OF SIMULTANEITY IN A SPECIAL THEORY OF RELATIVITY.
V. N. Strel'tsov. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Relativity theory, *Time measurement), Coordinates, Reflection, Signals, Velocity, Visible radiation.

For abstract, see NSA 28 02, number 04467.

LNF-72/103/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
CONFORMAL COVARIANT WILSON EXPANSION IN PERTURBATION THEORY.
S. Ferrara, A. F. Grillo, and G. Parisi. 6 Dec 72, 10p
U.S. Sales Only.

Descriptors: Conformal invariance, Coupling constants, Perturbation theory, Scale invariance, Series expansion, Symmetry breaking, Ward identity.

For abstract, see NSA 28 03, number 07225.

LNF-73/1/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
RENORMALIZABILITY OF NOT RENORMALIZABLE THEORIES.
G. Parisi. 8 Jan 73, 4p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Renormalization), (*Scattering amplitudes, Renormalization), Diagrams, Ladder approximation.

For abstract, see NSA 28 03, number 07226.

N-73-12387/GA PC$4.00/MF$1.45
California Inst. Of Tech., Pasadena.
NEW THEORY OF GRAVITY.
W. T. Ni. 1972, 11p NASA-CR-129242

Descriptors: General relativity theory, Gravitation, Metrics, Shape, Space.

For abstract, see NSA 28 03, number 06610.

N73-27610/7GA PC$3.00/MF$1.45
California Univ., Santa Barbara. Dept. of Mechanical Engineering.
THE RELATIVISTIC DYNAMICS OF A POINT CHARGE IN THE FIELD OF A PLANE ELECTROMAGNETIC WAVE TRAVELING IN THE DIRECTION OF A UNIFORM STATIC MAGNETIC FIELD.
T. P. Mitchell. Jun 73, 18p NASA-CR-132781
Contract NGL-05-010-020

Descriptors: *Electromagnetic interactions, *Electromagnetic radiation, *Magnetic fields, *Relativistic particles, Field theory (Physics), Particle motion, Quantum electrodynamics.

For abstract, see STAR 1118

RISO-M-1589/GA PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
COHERENT CONCEPT IN CLASSIC AND QUANTUM MECHANICAL INTERPRETATION.
S. Hanson. Mar 73, 20p
In Danish. U.S. Sales Only.

Descriptors: Classical mechanics, Coherent radiation, Laser radiation, Quantum mechanics, Uncertainty principle.

For abstract, see NSA 28 03, number 07766.

20K. Solid Mechanics

AD-767 168/8GA PC$4.50/MF$1.45
Illinois Univ Urbana Dept of Civil Engineering
FINITE ELEMENT ANALYSIS OF INTERSECTING CYLINDERS.
Civil engineering studies,
S. A. Bakhrebah, and W. C. Schnobrich. Sep 73, 145p Rept nos. UILU-ENG-73-2018, Structural Research Ser-400
Contract N00014-67-A-0305-0010

Descriptors: (*Cylindrical bodies, Stresses), (*Structural shells, Joining), Loading(Mechanics), Shear stresses, Load distribution, Deformation, Numerical analysis, Elasticity, Theses.
Identifiers: Finite element analysis, Intersecting cylinders, *Cylindrical shells, Plates(Structural members).

Two and three-dimensional isoparametric nonconforming finite elements are developed and adapted to the shell intersection problem. Two-dimensional elements model the shells away from the intersection region while three-dimensional elements are used right at the intersection. A transition element connects these two dissimilar elements. In addition to plane, plate, and shell standard test problems, the procedure is also applied to normally intersecting cylinders of near-equal diameters. Comparison is made between computed results and those obtained from careful experiments. The excellent agreement between the results of the two procedures is demonstrated. (Author)

AD-767 169/6GA PC$4.25/MF$1.45
Illinois Univ Urbana Dept of Civil Engineering
USE OF NONCONFORMING MODES IN FINITE ELEMENT ANALYSIS OF PLATES AND SHELLS.
Technical rept.,
Chang-Koon Choi, and William C. Schnobrich.
Sep 73, 124p Rept nos. Structural Research Ser-401, UILU-ENG-73-2019
Contract N00014-67-A-0305-0010

Descriptors: (*Structural shells, Loading(Mechanics)), (*Stresses, Structural shells), Deformation, Strain(Mechanics), Beams(Structural), Differential equations, Integration, Curve fitting, Graphics, Theses.
Identifiers: *Finite element analysis, Structural analysis, *Plates(Structural members), Numerical integration.

The development of another finite element is presented in the study. By adding nonconforming displacement modes selectively to the low order isoparametric elements, highly improved new shell elements are established. Addition of various combinations of nonconforming modes to the original elements has been investigated and the elements, both linear and quadratic, which have two nonconforming modes added to the inplane displacements, four to the out-of-plane displacement and no additional modes to rotations have been found to be most effective in terms of the number of nonconforming modes used versus the improvement obtained. These elements have been tested with deep beam, plate, and various shell problems. Cylindrical, elliptic paraboloid, spherical and conoidal shells were investigated in order to demonstrate the versatility of newly developed nonconforming elements. The results obtained from these investigations compare favorably with the results from well-established analyses. The improvement incorporated into the four-node element is impressive. (Author)

AD-767 260/3GA PC$3.00/MF$1.45
Watervliet Arsenal N Y
ADJOINT VARIATIONAL PRINCIPLES FOR COUPLED THERMOMECHANICAL SYSTEMS AND APPLICATION TO DYNAMIC STABILITY PROBLEMS.
Technical rept.,
Julian J. Wu. Aug 73, 20p Rept no. R-WV-T-2-27-73

Descriptors: (*Elasticity, Differential equations), Thermal stresses, Dynamics, Stability, Damping, Numerical analysis, Calculus of variations.
Identifiers: *Finite element analysis, *Thermoelasticity, *Structural analysis.

In conjunction with the differential equations of coupled thermoelasticity with initial stresses, adjoint variational principles were formulated in the report by introducing a set of adjoint differential equations. The natural and imposed boundary conditions for the original and the adjoint problems are obtained also with respect to each variational principle. These results can be used as basis for the finite element or other Ritz type of approximations to solve dynamic stability problems with nonconservative loads. (Author)

AD-767 264/5GA PC$4.50/MF$1.45
Lehigh Univ Bethlehem Pa Center for the Application of Mathematics
LARGE AMPLITUDE WAVES IN BOUNDED MEDIA. II. THE INITIAL DEFORMATION OF AN IMPULSIVELY LOADED SLAB,
Y. Kazakia, and E. Varley. Sep 73, 129p Rept no. CAM-140-4 BRL-CR-119
Contract DAAD05-71-C-0389
See also report dated May 72, AD-746 642.

Descriptors: (*Mechanical waves, Interfaces), (*Deformation, Materials), Shock waves, Elasticity, Solids, Stresses, Strain(Mechanics), Numerical analysis.
Identifiers: *Elastic waves, Polycrystalline.

The paper continues the investigation of large amplitude waves in bounded media started by H. M. Cekirge and E. Varley (1973). It describes the early stages of the deformation produced in an elastic slab contained between two parallel, plane interfaces when the normal traction at one of them changes discontinuously. During the subsequent deformation energy is radiated across these interfaces to adjacent elastic materials. The disturbance in the slab could be caused by the arrival of a constant strength shock wave traveling through an adjacent material or when the slab, which forms part of a composite material, impacts some other elastic material. It is assumed that the dynamic response of the slab can be approximated by that of one of the model materials introduced in the first part of this study. It is shown that this is possible for a whole host of materials. These include polycrystalline solids, metals when subjected to high pressure, water, explosive products, gases and yarns as well as elastic-plastic, rigid-plastic and rigid-elastic materials. (Modified author abstract)

AD-767 404/7GA PC$2.75/MF$1.45
Washington Univ Seattle Dept of Mechanical Engineering
A SIMPLE PROCEDURE FOR ESTIMATING STRESS INTENSITY FACTOR IN REGION OF HIGH STRESS GRADIENT.
Interim technical rept. no. 1,
Albert S. Kobayashi. Sep 73, 25p
Grant DA-ARO-D-31-124-73-G38

Descriptors: (*Structural parts, Stresses), Cracks, Crack propagation, Fatigue(Mechanics), Elasticity, Numerical analysis, Fracture(Mechanics).
Identifiers: *Fracture mechanics, Finite element analysis.

Simple procedures for estimating stress intensity factors of through-cracks and semi-elliptical cracks in regions of high stress gradient have been presented. Stress intensity factors for cracks emanating from an unfilled hole, an interference fitted hole, a hole with a concentrated load, and on the external and internal surfaces of a pressurized cylinder, were determined by these procedures. These procedures should be of practical interest for engineers involved in day-to-day problems in fracture mechanics. (Author)

AD-767 567/1GA Not available NTIS
Shock and Vibration Information Center (Defense) Washington D C
THE SHOCK AND VIBRATION DIGEST. VOLUME 5, NUMBER 9, SEPTEMBER 1973.
Sep 73, 54p
See also Volume 5, Number 8, AD-765 258.

Availability: Paper copy available from Shock and Vibration Information Center, Code 8020 Naval Research Lab., Washington, D.C. 20375. Annual subscription $25.00.

Descriptors: (*Vibration, *Reports), (*Shock(Mechanics), Reports), Integral transforms, Design, Mathematical models, Structural parts, Damping, Experimental data, Abstracts.
Identifiers: Dynamic response, Computer aided design, Finite element analysis.

The report contains articles and abstracts relative to shock and vibration phenomena in the following categories: analysis and design, environments, phenomerology, experimentation, components, and systems.

AD-767 589/5GA PC$3.50/MF$1.45
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
BUCKLING OF CYLINDRICAL SHELLS WITH AXISYMMETRIC TOROIDAL INITIAL IMPERFECTIONS.
Final rept. Jan 69-Apr 70,
Clark E. Beck. Jul 73, 56p Rept no. AFFDL-TR-73-81

Descriptors: (*Structural shells, *Buckling(Mechanics)), (*Aerospace craft, Buckling(Mechanics)), Cylindrical bodies, Compressive properties, Stresses, Loading(Mechanics), Numerical analysis.
Identifiers: *Cylindrical shells.

Some recent advances in thin shell buckling theory which tend to explain the discrepancy between experiment and theory are reviewed. The results of a digital computer study to determine the effect of three discrete axisymmetric imperfections on the buckling load of two specific circular cylindrical shells are presented and discussed. The shells were 40 inches long with wall thicknesses of 0.02 inch and radii of five and ten inches. Initial imperfection amplitudes considered were 0.005, 0.01 and 0.02 inch. (Autho)

AD-767 610/9GA PC$5.50/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
CONTRIBUTIONS TO THE THEORY OF RANDOMLY FORCED, NONLINEAR, MULTIPLE-DEGREE-OF-FREEDOM, COUPLED MECHANICAL SYSTEMS.
Technical rept. 5 Jan 70-4 Feb 71,
H. L. Fox, P. W. Smith, Jr., R. W. Pyle, and P. R. Nayak. Aug 73, 208p Rept no. BBN-2279 AFFDL-TR-72-45
Contract F33615-70-C-1206

Descriptors: (*Vibration, Nonlinear systems), Loading(Mechanics), Oscillation, Statistical analysis, Partial differential equations, Curve fitting, Graphics, Computer programs.
Identifiers: Degrees of Freedom, Computerized simulation.

Several alternative methods are developed for calculating probability functions and spectra of the response of randomly forced, nonlinear, multiple-degree-of-freedom, coupled mechanical systems. Calculations are made with one of the methods using the assumptions that the force spectrum is white and that all degrees-of-freedom are equally forced and have the same damping factor. The results (for a hinged beam) show that with increasing mean energy the frequency of maximum spectral density of displacement increases, the apparent bandwidth increases, and the mean square response decreases. These are verified by a computer simulation. (Author)

N73-27598/4GA PC$8.75/MF$1.45
Southampton Univ. (England). Inst. of Sound and Vibration Research.
THE CHARACTERISATION OF WAVE PROPAGATION MECHANISMS USING

TRANSIENT EXCITATION: NON-DISPERSIVE WAVES IN SIMPLE LUMPED SYSTEMS.
P. J. Holmes. Nov 72, 132p ISVR-TR-57
Subm-Sponsored by Min. Of Defence.

Descriptors: *Cross correlation, *Dynamic structural analysis, *Frequency response, *Spectrum analysis, Linear systems, Lumping, Propagation modes, Random loads, Resonant frequencies, Transient loads, Wave excitation.

For abstract, see STAR 1118

N73-27783/2GA PC$3.00/MF$1.45
Virginia Univ., Charlottesville.
PERFORM - A PERFORMANCE OPTIMIZING COMPUTER PROGRAM FOR DYNAMIC SYSTEMS SUBJECT TO TRANSIENT LOADINGS.
W. D. Pilkey, B. P. Wang, Y. Yoo, and B. Clark.
Jun 73, 232p NASA-CR-2268, AEEP-4085-105-71U
Contract NGR-47-005-145

Descriptors: *Dynamic loads, *Force distribution, *Structural analysis, *Transient loads, Applications of mathematics, Computer programs, Mathematical models, Stress analysis.

For abstract, see STAR 1118

N73-28593/4GA PC$3.50/MF$1.45
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
THE INTERACTION BETWEEN INCLUSIONS AND CRACKS.
F. Erdogan. May 73, 28p NASA-CR-132292, IFSM-73-42
Contract NGR-39-007-011

Descriptors: *Cracks, *Fracture mechanics, *Inclusions, Ceramics, Composite materials, Stresses.

For abstract, see STAR 1119

N73-28880/5GA PC$7.25/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
CALCULATION OF NATURAL VIBRATIONS OF SINGLE CYLINDRICALLY CURVED OPEN SHELLS.
G. Kotowski. Jul 73, 104p NASA-TT-F-14979, DLR-FB-71-92
Contract NASW-2483
Tran-Transl. Into English of "Berechnung der Eigenschwingungen Einfach Kreisbogenfoermig Gekruemmter Offener Schalen" Dfvlr, Goettingen, West Germany, Report Dlr-FB-71-92.

Descriptors: *Bending vibration, *Curved panels, *Cylindrical shells, *Numerical analysis, Germany, Ritz averaging method, Vibration mode.

For abstract, see STAR 1119

N73-28885/4GA PC$3.00/MF$1.45
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
THE PROBLEM OF EDGE CRACKS IN AN INFINITE STRIP.
G. D. Gupta, and F. Erdogan. Apr 73, 19p NASA-CR-132288, NASA-TR-73-7
Contracts NGR-39-007-011, NSF GK-11977

Descriptors: *Cracks, *Elastostatics, Boundary value problems, Edges, Half planes, Integral equations, Strip.

For abstract, see STAR 1119

N73-28886/2GA PC$3.75/MF$1.45
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
INTERACTION BETWEEN A CIRCULAR INCLUSION AND AN ARBITRARILY ORIENTED CRACK.
F. Erdogan, G. D. Gupta, and M. Ratwani. May 73, 33p NASA-CR-132291, IFSM-73-41
Contracts NGR-39-007-011, NSF GK-11977

Descriptors: *Cracks, *Inclusions, *Stresses, Elastic media, Green function, Integral equations.

For abstract, see STAR 1119

N73-28888/8GA PC$3.75/MF$1.45
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
BONDED HALF PLANES CONTAINING AN ARBITRARILY ORIENTED CRACK.
F. Erdogan, and O. Aksogan. May 73, 35p NASA-CR-132290, IFSM-73-40
Contracts NGR-39-007-011, NSF GK-11977

Descriptors: *Composite materials, *Crack propagation, *Half planes, Mellin transforms, Stress analysis.

For abstract, see STAR 1119

N73-28890/4GA PC$9.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
PERFORMANCE OF STATISTICAL ENERGY ANALYSIS.
Final Report.
R. F. Davis, and D. E. Hines. Jun 73, 138p NASA-CR-124322, MDC-G4741
Contract NAS8-28435

Descriptors: *Energy transfer, *Statistical analysis, *Structural vibration, High frequencies, Modal response, Prediction analysis techniques.

For abstract, see STAR 1119

SCL-DR-720019/GA PC$8.25/MF$1.45
Sandia Labs., Livermore, Calif.
RIBSTEAK: A COMPUTER PROGRAM FOR CALCULATING THE DYNAMIC MOTION OF CYLINDRICAL AND CONICAL SHELLS.
A. F. Emery, and F. J. Cupps. Apr 73, 123p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *R codes), (*Shells, *Stresses), Cylindrical configuration, Lagrange equations, Motion.

For abstract, see NSA 28 02, number 04986.

SLA-73-126/GA PC$3.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station.
SAMMSOR III: A FINITE ELEMENT PROGRAM TO DETERMINE STIFFNESS AND MASS MATRICES OF RING-STIFFENED SHELLS OF REVOLUTION.
W. E. Haisler, J. A. Stricklin, and W. A. Von Riesemann. 1 Dec 72, 96p TEES-72-26

Descriptors: (*Shells, *Mechanical properties), (*Computer codes, *S codes), Finite element method, Geometry, Mass, Matrices, Mechanical structures, Rotation.

For abstract, see NSA 28 03, number 07782.

SLA-73-127/GA PC$3.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station. Dept. Of Aerospace Engineering.
DYNAPLAS: A FINITE ELEMENT PROGRAM FOR THE DYNAMIC, LARGE DEFLECTION, ELASTIC-PLASTIC ANALYSIS OF STIFFENED SHELLS OF REVOLUTION.
W. E. Haisler, J. A. Stricklin, and W. A. Von Riesemann. 1 Dec 72, 160p TEES-72-27
Contract 82-6868

Descriptors: (*Shells, *Elasticity), (*Computer codes, *D codes), Finite element method, Plasticity, Rotation.

For abstract, see NSA 28 02, number 04988.

WAPD-TM-1079/GA PC$7.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA.
MESH 3D: A THREE-DIMENSIONAL FINITE ELEMENT MESH GENERATOR PROGRAM FOR EIGHT-NODE ISOPARAMETRIC ELEMENTS.
D. N. Hutula, and S. M. Zeiler. Mar 73, 103p
Contract AT(11-1)-Gen-14

Descriptors: (*Computer codes, *M codes), (*Mechanics, Computer codes), Cdc computers, Digital computers, Finite element method, Fortran, Three-dimensional calculations.

For abstract, see NSA 28 02, number 04993.

WAPD-TM-1081/GA PC$11.75/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA.
MATUS: A THREE-DIMENSIONAL FINITE ELEMENT PROGRAM FOR SMALL-STRAIN ELASTIC ANALYSIS.
D. N. Hutula, and B. E. Wiancko. Mar 73, 194p
Contract AT-11-1-GEN-14

Descriptors: (*Computer codes, *M codes), (*Mechanical structures, *Stress analysis), Elasticity, Finite element method, Strains, Three-dimensional calculations.

For abstract, see NSA 28 02, number 04994.

20L. Solid-State Physics

AD-767 087/0GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
RELATIVISTIC ELECTRONIC BAND STRUCTURE AND PROPERTIES OF THE HEAVIER ACTINIDES: A SECOND RARE EARTH SERIES,
D. D. Koelling, and A. J. Freeman. 1972, 6p
AFOSR-TR-73-1605
Grant AF-AFOSR-2012-71
Availability: Pub. in Proceedings of American Institute of Physics, Annual Conference (18th), Denver. Magnetism and Magnetic Materials, n10 p1300-1303 1972.

Descriptors: (*Actinide series, *Band theory of solids), Plutonium, Americium, Curium, Berkelium, Magnetic moments.
Identifiers: Face centered cubic lattices, Relativistic augmented plane wave method, Magnetic ordering.

The heavier actinides i.e., Am and beyond, have been studied by means of RAPW calculations and are found to differ dramatically from the lighter metals: the 5f electrons appear to more localized spatially, overlap only weakly with their 5f neighbors and show band widths which are small relative to the Coulomb correlation energy. Hence, just as in the case of the rare earth metals, the 5f electrons may not be described by the band model. Instead, a localized description is required in which, as in the rare earths, Hund's rule intra-atomic exchange coupling produces localized 5f magnetic moments which can be ordered magnetically by indirect exchange interaction. (Author)

AD-767 092/0GA Reprint
Arizona Univ Tucson Dept of Physics
NOISE IN A JOSEPHSON JUNCTION,
Patrick A. Lee, and Marlan O. Scully. 1971, 7p
AFOSR-TR-73-1643
Grant AF-AFOSR-1921-70
Prepared in cooperation with Yale Univ., New Haven. Dept. of Physics and Massachusetts Inst. of Tech., Cambridge.
Availability: Pub. in NBS Conference on Precision Measurements, Gaithersburg, Md., p213-217 Aug 71.

Descriptors: (*Superconductors, Noise(Radio)), Superconductivity, Statistical mechanics, Tunneling(Electronics).
Identifiers: *Josephson junctions.

The problem is considered of a Josephson Junction interacting with a quantized electromagnetic field contained in a microwave cavity. Inasmuch as the cavity has a quality factor Q and an external current J flows in and out of the junction, this is a problem in non-equilibrium statistical mechanics. Using a technique that eliminates adiabatically the radiation field directly from the total density matrix equation of motion, the authors calculate the spectrum of the voltage fluctuations from which the linewidth of the emitted radiation is obtained. As a consequence of this calculation, it was found that the current-voltage characteristic is slightly modified at finite temperatures. A physical argument for this effect is given and possible experimental observation of this effect is discussed. (Modified author abstract)

AD-767 094/6GA Reprint
Arizona Univ Tucson Dept of Physics
NONEQUILIBRIUM PROPERTIES OF AN ISING-MODEL FERROMAGNET,
John C. Goldstein, and Marlan O. Scully. 22 May 72, 15p AFOSR-TR-73-1611
Grant AF-AFOSR-1921-70
Prepared in cooperation with Los Alamos Scientific Labs., New Mexico.
Availability: Pub. in Physical Review B, v7 n3 p1084-1096 Feb 73.

Descriptors: (*Ferromagnetism, Mathematical models), Magnetic moments, Equations of motion, Free energy.
Identifiers: *Ising ferromagnets.

The dynamical properties of a uniform--coupling Ising-model ferromagnet in contact with a thermal reservoir are studied using density-operator methods. The authors proceed from the reversible microscopic dynamics of the system reservoir to an irreversible equation of motion for the macroscopic magnetization probability density. The temporal evolution of the spin system is seen to depend upon details of the reservoir system, while the steady-state results yield the correct magnetic free energy and equation of state, independent of such details. (Modified author abstract)

AD-767 099/5GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THEORY OF MULTIPHONON ABSORPTION DUE TO ANHARMONICITY IN CRYSTALS,
Bernard Bendow, See-Chen Ying, and Stanford P. Yukon. 5 Feb 73, 12p Rept no. AFCRL-TR-73-0555
Availability: Pub. in Physical Review B, v8 n4 p1679-1689, 15 Aug 73.

Descriptors: (*Phonons, Absorption), Crystals, Green's function, Harmonic analysis, Infrared optical materials.
Identifiers: Multiphonon processes, Anharmonicity.

A theory of multiphonon absorption due to anharmonicity in crystals is presented, employing a Green's-function technique. In contrast to previous theories, the lattice-interaction potential is not expanded in powers of displacements. Therefore a single expression is obtained for the absorption coefficient alpha, which includes various classes of contributions to infinite order in phonons, and which is valid for all frequencies in the multiphonon regime. The results involve just the displacement-correlation tensor of the lattice, and the Fourier components of the interatomic potential nu. (Modified author abstract)

AD-767 102/7GA Reprint
California Univ Irvine Dept of Physics
ANALOGUE OF SURFACE RECONSTRUCTION IN A HEISENBERG FERROMAGNET.
Technical rept.,
S. E. Trullinger, and D. L. Mills. 2 Jan 73, 6p Rept no. TR-72-66 AFOSR-TR-73-1621
Grant AF-AFOSR-1936-70
Availability: Pub. in Solid State Communications, v12 n9 p819-823 1973.

Descriptors: (*Ferromagnetic materials, Antiferromagnetism), Europium compounds, Oxides, Magnetic moments.
Identifiers: *Heisenberg ferromagnet, Magnetic ordering, *Europium oxides, Face centered cubic lattices.

When the exchange interaction between spins in the surface of a Heisenberg ferromagnet is antiferromagnetic in sign, the surface region may order in an anti-ferromagnetic manner, even though the bulk is ferromagnetic. The properties of a model which exhibit this behavior are discussed from a theoretical point of view. The properties of the model are examined to see if by this means one can understand some aspects of recent observations of spin polarized photoemission from the surface of EuO. (Author)

AD-767 103/5GA Reprint
City Coll New York Dept of Physics
THE HALL EFFECT IN DILUTE MAGNETIC ALLOYS: COPPER-GOLD(IRON),
Randall Caton, and Myriam P. Sarachik. 1973, 8p AFOSR-TR-73-1644
Grant AF-AFOSR-894-67
Availability: Pub. in AIP Conference Proceedings n10: Magnetism and Magnetic Materials, 18th Annual Conference, Denver 1972, p791-795 American Inst. of Physics, N.Y. 1973.

Descriptors: (*Magnetic alloys, Hall effect), Copper alloys, Gold alloys, Iron alloys.
Identifiers: Kondo effect.

The Hall coefficient has been measured for various concentrations of Fe in Cu-Au alloys. The contribution due to the Fe is found to be predominantly linear in impurity concentration, and the temperature and field dependence as a function of host composition are consistent with the existence of a low temperature spin-compensated state. The results can be understood in terms of a theoretical study by P. E. Bloomfield. (Author)

AD-767 139/9GA Reprint
Chicago Univ Ill James Franck Inst
EFFECTIVE MEDIUM THEORY FOR THE HALL EFFECT IN DISORDERED MATERIALS,
Morrell H. Cohen, and Joshua Jortner. 9 Jan 73, 6p AROD-8595:31-P
Grant DA-ARO-D-31-124-72-G152
Prepared in cooperation with Cambridge Univ., (England). Cavendish Lab. and Tel-Aviv Univ. (Israel). Dept. of Chemistry.
Availability: Pub in Physical Review Letters, v30 n15 p696-698, 9 Apr 73.

Descriptors: (*Hall effect, Theory), Electrical conductance, Magnetic fields, Transport properties, Tensor analysis.
Identifiers: Magnetoresistivity.

A classical effective-medium theory for the magnetoconductivity tensor in disordered materials which undergo a metal-nonmetal transition via a microscopically inhomogeneous transport regime is presented. (Author)

AD-767 145/6GA Reprint
Duke Univ Durham N C Dept of Physics
VELOCITY OF SOUND IN SOLID HEXAGONAL CLOSE-PACKED H2 AND D2,
R. Wanner, and H. Meyer. 5 Dec 72, 33p AROD-11317:1-P
Grant DA-ARO-D-31-124-73-G111
Availability: Pub. in Jnl. of Low Temperature Physics, v11 n5/6 p715-744 1973.

Descriptors: (*Solidified gases, Sound transmission), Single crystals, Hydrogen, Deuterium, Cryogenics, Velocity.
Identifiers: Hexagonal close packed lattices, Acoustic velocity, *Solid hydrogen.

Sound velocity measurements are reported on samples of hexagonal close-packed H2 and D2, believed to be single crystals. (Modified author abstract)

AD-767 148/0GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
THE DEFORMATION THEORY OF THERMOPLASTICITY,
V. S. Lenskii, and V. A. Lomakin. 11 Apr 73, 14p Rept no. FSTC-HT-23-2320-72
Trans. of Teplovye Napryazheniya v Elementakh Konstruktsii (USSR) n10 p37-51 1970.

Descriptors: (*Deformation, Theory), Plasticity, Thermal stresses, Loading(Mechanics), Boundary value problems, Partial differential equations, Integration, USSR.
Identifiers: Translations, *Thermoplasticity, Plastic deformation.

A study of the foundation of the deformation theory of thermoplasticity is given which considers the functional relationship between mechanical properties of the medium and temperature.

AD-767 151/4GA Reprint
Chicago Univ Ill James Franck Inst
FAR-ULTRAVIOLET REFLECTANCE OF II-VI COMPOUNDS AND CORRELATION WITH THE PENN-PHILLIPS GAP,
John L. Freeouf. 15 Sep 72, 23p AFOSR-TR-73-1584
Contracts F44620-71-C-0025, F44620-70-C-0029
Availability: Pub. in Physical Review B, v7 n8 p3810-3830, 15 Apr 73.

Descriptors: (*Semiconductors, Band theory of solids), Ultraviolet radiation, Reflection, Zinc compounds, Oxides, Selenides, Tellurides, Zinc sulfides, Beryllium oxides, Magnesium oxides, Cadmium selenides, Cadmium sulfides, Cadmium compounds, Absorption spectrum, Brillouin zones.
Identifiers: Far ultraviolet radiation, Zinc oxides, Zinc selenides, Zinc tellurides, Cadmium tellurides, Cadmium oxides, Synchrotron radiations.

Synchrotron radiation and standard light sources have been used to measure the polarization-dependent reflectance spectra of BeO, ZnO, ZnS, ZnSe, ZnTe, MgO, CdO, CdS, CdSe, and CdTe for photon energies 0.6 <(h bar)omega<30 eV at temperatures 90<T<400K. The reflectance was analyzed via the Kramers-Kronig relations. Curves are reported for epsilon (1), epsilon(2), -Im(1/xi), and N(eff)(h bar)omega for all of the IIB-VI compounds studied. Strong structures in the valence-band transition region of the zinc compounds and of the cadmium compounds were found to scale linearly with the Penn-Phillips average energy gap. Reflectance structures corresponding to core excitations were observed. A doublet at about 13.5 eV in CdS, CdSe, and CdTe was identified as a spin-orbit-split transition from the Cd 4d level. The observed spin-orbit splitting of this level was 0.6 eV. A shoulder on the low-energy side of this doublet in CdTe at 12.8 eV is identified as originating in the Te 5s band.

AD-767 153/0GA Reprint
Chicago Univ Ill James Franck Inst
CONTACT AND SURFACE PHOTOVOLTAGE OF AMORPHOUS SEMICONDUCTORS,
Horng-Yhi Wey, and H. Fritzsche. 1972, 8p AFOSR-TR-73-1640
Contract F44620-71-C-0025
Availability: Pub. in Proceedings of the International Conference on the Physics of Semiconductors Held in Warsaw (Poland) in 1972, p555-560.

Descriptors: (*Semiconductors, Photoconductivity), Solid solutions, Germanium compounds, Arsenides, Tellurides, Sulfides, Space charges, Capacitance.
Identifiers: *Amorphous semiconductors, Photovoltaic effect, Electric contacts.

Contacts between different metals and an amorphous semiconductor was studied by illuminating the contact through semitransparent metal electrodes. The chalcogenide alloy used was Ge16As35Te28S21. The open-circuit photovoltage, photoconductivity, capacitance and I-V characteristic were measured. Results are discussed. (Modified author abstract)

AD-767 154/8GA Reprint
Chicago Univ Ill James Franck Inst
PHOTOVOLTAIC EFFECT AND SPACE CHARGE CAPACITANCE OF AMORPHOUS SEMICONDUCTOR-METAL CONTACTS,
Horng-Yhi Wey, and H. Fritzsche. 1972, 7p AFOSR-TR-73-1609
Contract F44620-71-C-0025
Availability: Pub. in Jnl. of Non-Crystalline Solids, v8 n10 p336-340 1972;(Proceedings of the International Conference on Amorphous and Liquid Semiconductors (4th), Ann Arbor, Mich., Aug 71).

Descriptors: (*Semiconductors, Photoconductivity), Germanium compounds, Arsenides, Tellurides, Sulfides, Capacitance, Space charges, Photoelectric effect.
Identifiers: *Amorphous semiconductors.

The space charge region of contacts to amorphous semiconductors were studied by measuring at various temperatures (1) the photovoltage as a function of light intensity and wavelength and (2) the space charge capacitance as a function of frequency. Semitransparent electrodes of Au, Sb, Al, SnO2, and nichrome were used. For all except Sb the illuminated metal electrode has negative polarity. The photovoltage increases first linearly with photon flux and then logarithmically. Capacitance measurements suggest the presence of 'blocking' barriers for holes. The width is about several hundred Angstrom. The chalcogenide alloy used was Ge16As35Te28S21. (Author)

AD-767 157/1GA Reprint
Chicago Univ Ill James Franck Inst
ELECTRONIC PHENOMENA IN AMORPHOUS SEMICONDUCTORS,
H. Fritzsche. 1972, 50p AFOSR-TR-73-1608
Contract F44620-71-C-0025
Availability: Pub. in The Annual Review of Materials Science, v2 p697-744 1972.

Descriptors: (*Semiconductors, Band theory of solids), Semiconducting films, Dielectrics, Electrical conductance, Direct current, Hall effect, Alternating current, Photoconductivity.
Identifiers: *Amorphous semiconductors, Density of states, Carrier mobility, Thin films.

Representing systems of higher complexity, amorphous semiconductors require for their characterization a larger number of parameters than their crystalline counterparts. Furthermore, the theoretical difficulty of calculating the distribution of electronic states and their transport properties in disordered structures and the resulting need for simplifying approximations provide the theoretical expression with considerable flexibility. At the same time amorphous semiconductors yield experimental data which are typically less structured and hence less rich in information than the equivalent data obtained with crystalline semiconductors. As a consequence many experiments fail to distinguish between mechanisms of quite different physical origin. With this in mind the author presents a critical review of the electrical properties of various classes of amorphous semiconductors. Particular attention is paid to evidence of heterogeneities, internal voids, and other preparation sensitive defects which are expected to influence the electronic properties. The special nature of contacts and non-equilibrium phenomena in amorphous semiconductors are discussed. (Modified author abstract)

AD-767 159/7GA Reprint
Cornell Univ Ithaca N Y Materials Science Center
PHOTOLUMINESCENCE AT HIGH EXCITON DENSITIES IN CdS,
J. F. Figueira, and H. Mahr. 2 Nov 72, 8p Rept nos. TR-13, MSC-1898
Contract N00014-67-A-0077-0019
This work is presented in the PH.D thesis of J. F. Figueira (Cornell University 1971) (unpublished) and is available as MSC Report no. 1572.
Availability: Pub. in the Physical Review B, v7 n10 p4520-4525, 15 May 73.

Descriptors: (*Cadmium sulfides, Luminescence), Band theory of solids, Pumping(Optical), Cryogenics, Excitons.
Identifiers: *Photoluminescence.

The report is concerned with exciton interactions in CdS at 4.2K in a range of concentrations where exciton densities are very large (approximately 10 to the 19th power/cc) and the independent-particle description of the exciton is no longer valid. The exciton interactions are studied by monitoring the photoluminescence emission from this compound when excited by intense laser radiation. The exciton-emission spectra of CdS were studied as a function power in the region of the M band (4904 A). As the laser power is increased from 100 kW/sq cm to 8 MW/sq cm, several new emission bands appear on the long-wavelength side of the M band shifted by several meV from the M band. Both of these new bands show a superlinear dependence on laser power. Several theories for the behavior of high-density exciton systems are examined, and it is shown that the formation and subsequent decay of an excitonic molecule can consistently explain the observed photoluminescence behavior. A molecular binding energy of 3-4 meV for the excitonic molecule in CdS is deduced. (Author)

AD-767 166/2GA Reprint
Washington Univ Seattle Dept of Physics
GENERATION OF UP-CONVERTED OR DOWN-CONVERTED PHOTON ECHOES IN THREE-LEVEL RESONANT MEDIUM,
E. Y. U. Lu, and L. E. Wood. 12 Mar 73, 5p AFOSR-TR-73-1612
Contract F44620-69-C-021
Availability: Pub. in Physics Letters, v44A n1 p68-70 May 73.

Descriptors: (*Electron transitions, Pumping(Optical)), Light pulses, Atomic energy levels.
Identifiers: *Photon echoes.

The equations describing the interaction of optical pulses with three-level resonant media are considered. It is shown that the resonant medium, if excited by suitable sequences of ultrashort optical pulses, can generate up-converted or down-converted photon echoes. (Author)

AD-767 172/0GA Reprint
IBM Thomas J Watson Research Center Yorktown Heights N Y
THEORY OF INFRARED AND RAMAN SPECTRA OF AMORPHOUS SI AND GE,
J. E. Smith, Jr., M. H. Brodsky, R. Alben, and D. Weaire. 20 Feb 73, 5p AFOSR-TR-73-1607
Contract F44620-71-C-0039, Grant NSF-GH-35999
Prepared in cooperation with Yale Univ., New Haven, Conn. Dept. of Engineering and Applied Science.
Availability: Pub. in Physical Review Letters, v30 n22 p1141-1144, 28 May 73.

Descriptors: (*Germanium, Raman spectroscopy), (*Silicon, Raman spectroscopy), Semiconductors, Infrared spectroscopy, Dipole moments, Polarization.
Identifiers: *Amorphous semiconductors, Light scattering, Density of states.

A theory of infrared and Raman spectra, based on a two-parameter elastic energy and simple local-bond optical coupling mechanisms, is developed for amorphous silicon (a-Si) and amorphous germanium (a-Ge). When the theory is applied to a random-network structural model the results are in satisfactory agreement with experiment, especially with regard to the qualitative differences between the infrared and Raman spectra. Results for simple microcrystalline models are also presented. (Author)

AD-767 301/5GA PC$5.25/MF$1.45
Pennsylvania State Univ University Park Materials Research Lab
MATERIALS PREPARATION AND CHARACTERIZATION.
Annual technical progress rept. 1 Jul 72-30 Jun 73. Aug 73, 179p
Contract DA-49-083-OSA-3140, Grant NSF-GH-34547
See also report dated Sep 72, AD-749 974.

Descriptors: (*Materials, Scientific research), Integrated circuits, Oxides, Crystal growth, Infrared windows, X-ray diffraction analysis, Phase studies, Sputtering, Films, Coatings, Cements, Crystal structure, Ceramic materials, Surfaces, Silicates, Glass, Strain(Mechanics), Superconductors, Carbon, Semiconductors, Geochemistry, Optical properties, Magnetic properties, Crystals, Physical properties, Archaeology, Information retrieval, Education.
Identifiers: Glassy carbon, Lunar rock, Carbonization.

The report summarizes research conducted of the Materials Research Laboratory of Pennsylvania State University on various materials.

AD-767 370/0GA MF$1.45
Delaware Univ Newark Dept of Physics
ELECTRO-OPTICAL STUDIES.
Final rept. 15 Nov 63-15 Nov 70,
K. W. Boeer. 15 Nov 70, 102p
Contracts Nonr-4336(00), N00014-71-C-0169
Availability: Available in microfiche only.

Descriptors: (*Photoelectric materials, Scientific research), (*Photoconductivity, Solids), Cadmium sulfides, Semiconductors, Crystal lattice defects, Band theory of solids, Space charges.

The document contains listings of research performed during the seven years of the contract period. Also included is an article on the characterization of photoconductivity.

AD-767 411/2GA Reprint
California Univ San Diego La Jolla Dept of Physics
HIGH TEMPERATURE SUPERCONDUCTIVITY IN THE LI-TI-O TERNARY SYSTEM,
D. C. Johnston, H. Prakash, W. H. Zachariasen, and R. Viswanathan. 7 May 73, 10p AFOSR-TR-73-1795
Contract F44620-72-C-0017
Availability: Pub. in the Materials Research Bulletin, v8 p777-784 1973.

Descriptors: (*Superconductors, Oxides), Lithium compounds, Titanium compounds, Transition temperature, Superconductivity.
Identifiers: *Lithium oxides, *Titanium oxides, Magnetic susceptibility.

The first high temperature superconducting oxide compound is reported. The compound is Li(1+x)Ti(2-x)04 and has the face-centered cubic spinel structure, with an approximately 8.40 angstroms. The transition temperatures of this compound range from approximately 7K to 13.7K. (Author)

AD-767 464/1GA Reprint
Washington Univ Seattle Dept of Physics
SELF-CONSISTENT SCREENING IN A SIMPLE MODEL,
J. Rudnick, and E. A. Stern. 9 Nov 72, 13p
AFOSR-TR-73-1657
Grant AF-AFOSR-1967-71
Availability: Pub. in Physical Review B, v7 n12 p5062-5072, 15 Jun 73.

Descriptors: (*Band theory of solids, Alloys), Impurities, Approximation(Mathematics).
Identifiers: *Coherent potential approximation, Fermi surfaces, Tight binding theory.

The self-consistent screening of a charged impurity by conduction electrons in a simple cubic metal is calculated in the tight-binding approximation. (Modified author abstract)

AD-767 465/8GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics
LANDAU TRANSITIONS AT HIGHER GAPS IN INSB AND GASB,
S. O. Sari. 3 Jan 73, 6p AFOSR-TR-73-1750
Grant AF-AFOSR-2010-71
Availability: Pub. in Solid State Communications, v12 p705-708 1973.

Descriptors: (*Indium antimonides, *Band theory of solids), Gallium compounds, Antimony alloys, Magneto-optic effect, Reflectivity.
Identifiers: *Landau levels, *Gallium antimonides.

Landau levels have been resolved at the E(1) + delta(1) gap in InSb and at the E(1) edge in GaSb. Transverse reduced masses of 19 plus or minus 3 and 21.4 plus or minus 1.5 have been obtained at the respective edges. Using band gaps determined from the experiment, the spin-orbit splitting delta(1) has been measured as 0.500 plus or minus 0.013 eV in InSb. Combined with a measurement of the zone center spin-orbit splitting, this gives a ratio of 0.623 plus or minus 0.02 of slightly less than 2/3. (Author)

AD-767 466/6GA Reprint
Massachusetts Inst of Tech Cambridge Center for Materials Science and Engineering
SYMMETRY CHARACTER OF THE E(1) EDGE IN INSB,
Seppo O. Sari. 26 Apr 73, 5p AFOSR-TR-73-1749
Grant AF-AFOSR-2010-71
Availability: Pub. in Physical Review Letters, v30 n26 p1323-1325, 25 Jun 73.

Descriptors: (*Indium antimonides, *Band theory of solids), Semiconductors, Anisotropy, Magneto-optic effect.
Identifiers: Landau levels.

Interband Landau transitions have been investigated magneto-optically as a function of crystal orientation at the E(1) edge of InSb. The energy spacings of the levels are largely independent of crystal orientation for a series of samples with surface normals in a (110) plane. This result is at variance with theories for bulk interband transitions at an anisotropic band edge. A hypothesis involving a bound surface resonance is suggested to explain the measurements. (Author)

AD-767 467/4GA Reprint
Illinois Univ Urbana Dept of Electrical Engineering
SERIES EQUIVALENT CIRCUIT REPRESENTATION OF SIO2-SI INTERFACE AND OXIDE TRAP STATES,
D. H. Eaton, and C. T. Sah. 14 Sep 72, 7p AFOSR-TR-73-1860
Grants AF-AFOSR-2067-71, NSF-GK-30283
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Availability: Pub. in Solid-State Electronics, v16 n8-A p841-846 1973.

Descriptors: (*Semiconductor devices, Simulation), (*Capacitors, Band theory of solids), Silicon dioxide, Silicon, Tunneling(Electronics), Electrical conductance, Capacitance, Band theory of solids, Interfaces.
Identifiers: *Equivalent circuits, Metal oxide semiconductors.

The small-signal frequency response of silicon dioxide-silicon interface and oxide trap states has been investigated and interpreted using a series R-C equivalent circuit model instead of the commonly used parallel R-C equivalent circuit model. It is shown that the series equivalent circuit model is advantageous in extracting the time constants of the oxide traps located in the silicon dioxide layer from experimental data and allows a determination of the spatial extension of the oxide traps. Comparisons of a two-step model, consisting of the Shockley-Read-Hall (SRH) transition between the band and the interface states and the elastic tunneling transition between the interface and oxide trap states, with experimental data are given to illustrate the range of experimental data required to evaluate an unique set of tunneling and SRH parameters. (Author)

AD-767 468/2GA Reprint
California Univ San Diego La Jolla Dept of Physics
MAGNETIC TO NONMAGNETIC TRANSITION OF CERIUM IMPURITIES IN (LA,TH) ALLOYS,
M. B. Maple, S. Ortega, M. Roth, and C. Rizzuto. 9 Mar 73, 5p AFOSR-TR-73-1794
Grant AF-AFOSR-2073-71
Prepared in cooperation with Chile Univ., Santiago. Facultad de Ciencias and Istituto di Scienze Eisiche and G.N.S.M. del C.N.R. Genova (Italy).
Availability: Pub in Solid State Communications, v13 p5-7 1973.

Descriptors: (*Superconductors, Transition temperature), Impurities, Cerium alloys, Thallium alloys, Magnetic properties, Lanthanum.

The initial depression of the superconducting temperature of (La,Th)Ce alloys has been measured. It has been found that there is a steep maximum in the initial depression as a function of La concentration in the (La,Th) matrix. This effect is compared with the nonmonotonic behavior of the critical temperature of LaCe under pressure. (Author)

AD-767 479/9GA Reprint
Connecticut Univ Storrs Dept of Physics
THERMAL CONDUCTIVITY OF COMPLEX DIELECTRIC CRYSTALS,
Micheline Roufosse, and P. G. Klemens. 29 Jan 73, 10p AFOSR-TR-73-1659
Grant AF-AFOSR-2418-73
Availability: Pub. in Physical Review B, v7 n12 p5379-5386, 15 Jun 73.

Descriptors: (*Thermal conductivity, Dielectrics), Phonons, Dispersion relations, Crystal structure.

The theory of the thermal resistivity of dielectric crystals at ordinary and high temperatures in terms of anharmonic three-phonon interactions is reformulated. The resistivity is similar in form to that obtained by Leibfried and Schlomann, but larger by a factor of 6.8. The theory is then extended to crystals where the unit cell contains many atoms. To include all three-phonon interactions one sums over all harmonics of the reciprocal-lattice vectors in an extended-zone representation. This sum increases the scattering rate. However, the matrix elements of the three-phonon processes are reduced in the case of large unit cells, because coherence is lost in the Fourier transform of the different bonds in each cell. A simplified model is chosen, and in this case the latter effect cancels the former, so that the anharmonic relaxation rate is substantially independent of the number of atoms per unit cell. (Modified author abstract)

AD-767 509/3GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
NUCLEAR-MAGNETIC-RESONANCE STUDY OF THE ELECTRONIC TRANSITION IN NEAR-EQUIATOMIC V-RU ALLOYS,
L. B. Welsh, and C. W. Chu. 27 Oct 72, 7p
AFOSR-TR-73-1751
Grant AF-AFOSR-2012-71
Sponsored in part by Atomic Energy Commission, Washington, D.C. and National Science Foundation, Washington, D.C.
Availability: Pub. in Physical Review B, v8 n3 p1026-1031, 1 Aug 73.

Descriptors: (*Vanadium alloys, Band theory of solids), (*Ruthenium alloys, Band theory of solids), Nuclear magnetic resonance, Frequency shift, Line spectrum, Atomic orbitals.
Identifiers: Density of states, Magnetic susceptability, Spin lattice relaxation.

For the near-equiatomic V-Ru alloys (46-50-at.% Ru) Chu et al. have observed dramatic changes in the electronic properties of these alloys with an accompanying tetragonal crystallographic distortion. Using the V(51) nuclear magnetic resonance as a probe of the electronic properties, the authors the Knight shift K and spin-lattice relaxation rate R in the high-temperature cubic phase and low-temperature tetragonal phase 4 is studied. The dramatic decrease in R and increase in K from the cubic to tetragonal phases are strongly concentration dependent. These results correlate well with the strongly concentration-dependent results for the bulk electronic properties. An analysis of the NMR and susceptibility data shows that the change in the electronic properties from the cubic to tetragonal phases results from a dramatic decrease of the d-electron density of states at the Fermi energy, and that R and K are dominated by the d-orbital contributions. (Modified author abstract)

AD-767 510/1GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics
OPTICAL SPECTROSCOPY IN SEMICONDUCTORS IN HIGH MAGNETIC FIELDS USING POLARIZATION MODULATION,
S. O. Sari, and S. E. Schnatterly. 1973, 14p
AFOSR-TR-73-1748
Grant AF-AFOSR-2010-71
Prepared in cooperation with Princeton Univ., N.J. Joseph Henry Lab.
Availability: Pub. in Surface Science, v37 p328-339 1973.

Descriptors: (*Semiconductors, Band theory of solids), Gallium arsenides, Phosphides, Germanium, Indium antimonides, Silicon, Magneto-optic effect, Reflectivity, Magnetic fields, Polarization, Spectroscopy.
Identifiers: Optical modulation spectra, Landau levels, Gallium phosphides.

Differential magneto-reflection spectra in the 1.8 to 5 eV energy range are presented for GaP, Ge, GaAs, InSb, and Si. These spectra were obtained using polarization-modulated light from (111) faces of samples in the Faraday configuration. In medium strength magnetic fields, the results are similar to those obtained using other techniques, such as electric field modulation and wavelength derivative spectroscopy in the same energy range. In higher magnetic fields (beta of 50kG or larger) more detailed structure is resolved. (Modified author abstract)

AD-767 512/7GA Reprint
California Univ Irvine Dept of Physics
PROPERTIES OF SURFACE POLARITONS IN LAYERED STRUCTURES,
D. L. Mills, and A. A. Maradudin. 30 May 73, 5p
AFOSR-TR-73-1894
Grants AF-AFOSR-1936-70, AF-AFOSR-2018-71
Availability: Pub. in Physical Review Letters, v31 n6 p372-375, 6 Aug 73.

Descriptors: (*Gallium arsenides, Raman spectroscopy), Semiconducting films, Substrates, Dispersion relations, Surfaces.
Identifiers: *Polaritons.

The authors present the theory of surface polaritons which propagate in a film of a surface-active material placed on a substrate. The theory provides a description of the new mode observed recently by Evans, Ushioda, and McMullen in the Raman spectrum of a GaAs film placed on a sapphire substrate. (Author)

AD-767 520/0GA Reprint
Salford Univ (England Dept of Electrical Engineering
TELLURIUM IMPLANTS INTO GAP AT ELEVATED TEMPERATURES - ATOM SITE LOCATION AND DAMAGE.
Rept. no. 5,
Arthur B. Campbell, William A. Grant, and George A. Stephens. 1973, 8p AFOSR-TR-73-1772
Grant AF-AFOSR-2115-71
Availability: Pub. in Radiation Effects, v17 p19-24 1973.

Descriptors: (*Semiconductors, Radiation damage), (*Gallium compounds, Ion bombardment), Phosphides, Impurities, Tellurium, Doping.
Identifiers: *Gallium phosphides, Ion implantation.

A study has been made of the effect of substrate temperature on the lattice positions and the damage produced by Te implants into GaP. GaP crystals of <111> orientation were implanted with 40 keV Te ions to a dose of 5 x 10 to the 15th power ions/sq cm at various temperatures up to 500C and analyzed using the Rutherford backscattering technique based on channelling. Implantation damage decreases with increasing implant temperature reaching 20% of the room temperature damage level following 500C implants. The percentage of Te retained in the target decreases with target temperature up to 350C when it has fallen to 45% of the room temperature implant level whereas above 350C the percentage retained increases so that following implantation at 500C it has returned to 80%. The percentage of Te occupying substitutional lattice sites increases with implant temperature and reaches a maximum of 65% at 350C and above. (Author)

AD-767 593/7GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE CONDUCTIVITY OF QUARTZ AFTER ELECTROLYSIS.
Physical sciences research papers,
Richard N. Brown. 31 Jul 73, 10p Rept nos. AFCRL-TR-73-0479, AFCRL-PSRP-556

Descriptors: (*Quartz, Electrical conductance), Electrolysis, Purification.

The author discusses the conductivity of crystalline alpha-quartz before and after electrolysis, as well as the processes occurring during electrolysis. It has been shown that the value of the conductivity can be used to indicate the progress of the treatment. (Author)

AD-767 630/7GA PC$4.25/MF$1.45
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
SMALL SCALE YIELDING ANALYSIS OF MIXED MODE PLANE STRAIN CRACK PROBLEMS,
Choon-Fong Shih. May 73, 41p Rept no. DEAP-S-1 AFOSR-TR-73-1692
Grants AF-AFOSR-2476-73, NGL-22-007-012

Descriptors: (*Fracture(Mechanics), Numerical analysis), Crack propagation, Stresses, Strain hardening.
Identifiers: Finite element analysis, Plasticity.

The small scale yielding analysis of an elastic-plastic body with a lone crack under plane strain conditions subject to combinations of Mode I and II loadings is examined. Dominant singularity solutions governing the asymptotic behavior of the stresses and strains at the crack tip are obtained for the complete range of loadings between Mode I and II. The results of an accurate finite element technique, which imbeds the dominant singularity solutions, directly relates the near-tip behavior to the elastic stress intensity factors KI and KII. Implications of this study to mixed mode fracture mechanics is also discussed, particularly with respect to the direction of crack initiation and the relation of fracture toughness under mixed models to that in Mode I. Details of the mixed mode plastic zone sizes and shapes are also given. (Author)

BLG-474/GA PC$3.50/MF$1.45
Centre d'Etude de l'Energie Nucleaire, Brussels (Belgium).
BEHAVIOUR OF A HELIUM CRYOSTAT FOR THE MEASUREMENT OF THE MAGNETIC SUSCEPTIBILITY BY THE FARADAY METHOD.
J. Vansummeren, and A. Van den Bosch. Sep 72, 26p
U.S. Sales Only.

Descriptors: (*Magnetic susceptibility, *Measuring methods), (*Cryostats, *Performance testing), Faraday method, Helium.

For abstract, see NSA 28 03, number 07660.

BNL-50336/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
INTERACTION OF ENERGETIC CHARGED PARTICLES WITH SOLIDS. A SUMMER SCHOOL IN MEMORY OF CAVID ERGINSOY HELD AT ROBERT COLLEGE, ISTANBUL, TURKEY, AUGUST 16--28, 1971.
A. N. Goland. Feb 73, 414p
Contract AT(30-1)-16

Descriptors: Annihilation, Charged particles, Crystal defects, Meetings, Plasmons, Positrons, Proceedings, Range, Solids, Stopping power, Thermodynamics.

For abstract, see NSA 28 03, number 06109.

CEA-CONF-2134/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
BUBBLE DOMAIN MEMORY MATERIALS.
D. Challeton, P. Coeure, J. Daval, J. Mareschall, and A. Mathiot. 25 Sep 72, 36p CONF-720989-1
U.S. Sales Only.

Descriptors: (*Magnetic materials, *Domain structure), (*Terbium compounds, Domain structure), (*Yttrium compounds, Domain structure), (*Garnets, Domain structure), Crystal growth, Iron oxides, Memory devices, Spinels.

For abstract, see NSA 28 03, number 07670.

COM-73-50789/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FIELD EMISSION ENERGY DISTRIBUTION (FEED).
Final rept.,
J. W. Gadzuk, and E. W. Plummer. 1973, 62p
Pub. in Reviews of Modern Physics, v45 n3 p487-548 Jul 73.

Descriptors: (*Field emission, Electron energy), (*Electron energy, Measurement), Tube cathodes, Theories, Reviews, Work functions, Band structure of solids, Chemisorption, Surface properties, Adsorption, Electron tunneling.

The technique of measuring the energy distribution of electrons which have been field emitted from a cold cathode is considered. The general historical and introductory theory is presented. A survey of the experimental techniques and existing energy analyzers is given. Specific studies on clean metal surfaces in which work functions, band structure effects, surface states, thermal effects, and many-body effects have been studied are reviewed from both the experimental and theoretical points of view. Field emission energy distributions have been particularly valuable in studies of atoms chemisorbed on surfaces. Several theories of enhanced resonance tunneling due to chemisorbed atoms are discussed. Specific systems studied experimentally are reviewed. Inelastic adsorbate enhanced tunneling is also treated.

COO-2103-25/GA PC$8.00/MF$1.45
Northwestern Univ., Evanston, Ill. Dept. Of Physics.
ELECTRONIC ENERGY BAND STRUCTURE OF THE ACTINIDE METALS. FINAL REPORT.
A. J. Freeman, and D. D. Koelling. 1973, 119p
Contract AT(11-1)-2103

Descriptors: (*Actinides, *Electronic structure), (*Uranium, Electronic structure), (*Plutonium, Electronic structure), (*Thorium, Electronic structure), Americium, Band theory, Berkelium, Bibliographies, Curium, Diagrams, Energy levels, Neptunium, Physical properties, Relativistic range, Reviews.

For abstract, see NSA 28 02, number 03184.

COO-3156-55/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. Of Applied Physics.
ENERGY ANALYSIS OF SMALL ANGLE DIFFRACTION PATTERNS IN ALUMINUM FILMS.
R. B. Pettit, J. Silcox, and R. Vincent. 2p CONF-710833-2

Descriptors: (*Aluminium, *Electron diffraction), Distribution, Energy losses, Energy spectra, Films.

For abstract, see NSA 28 02, number 05019.

COO-3156-56/GA PC$9.25/MF$1.45
Cornell Univ., Ithaca, N. Y. Materials Science Center.
FLUCTUATION DIAMAGNETISM OF ALUMINUM AND ALUMINUM ALLOYS ABOVE THE SUPERCONDUCTING TRANSITION TEMPERATURE.
J. H. Claassen. Jan 73, 142p

Descriptors: (*Aluminium, *Superconductivity), (*Aluminium base alloys, Superconductivity), (*Silver alloys, Superconductivity), (*Silicon alloys, Superconductivity), Crystals, Diamagnetism, Magnetic fields, Order parameters, Temperature dependence, Transition temperature, Variations.

For abstract, see NSA 28 02, number 03983.

COO-3158-15/GA PC$3.50/MF$1.45
Cornell Univ., Ithaca, N. Y. Dept. Of Materials Science and Engineering.
MODIFIED GREEN'S FUNCTION TECHNIQUE FOR THE CALCULATION OF LATTICE DISTORTION SURROUNDING INTERSTITIALS.
R. Benedek, and P. S. Ho. 23 Jan 73, 28p
Contract AT(11-1)-3158

Descriptors: (*Tungsten, Crystal lattices), (*Crystal lattices, *Interstitials), Configuration, Crowdions, Green function, Point defects, Relaxation, Variations.

For abstract, see NSA 28 02, number 05018.

COO-3311-11/GA PC$3.00/MF$1.45
Lehigh Univ., Bethlehem, PA. Dept. Of Metallurgy and Materials Science.
FORMING OF COMPOSITE FOR SUPERCONDUCTING ROD. TECHNICAL PROGRESS REPORT.
W. C. Jr. Hahn. 5 Mar 73, 4p
Contract AT(11-1)-3311

Descriptors: (*Superconductors, *Composite materials), Aluminium, Fabrication, Niobium alloys, Rods, Titanium alloys, Wires.

For abstract, see NSA 28 02, number 04012.

IA-1272/GA PC$3.00/MF$1.45
Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center.
VIBRONIC LEVELS IN F-CENTRE EXCITED STATES.
R. Englman. Oct 72, 12p
U.S. Sales Only.

Descriptors: (*F centers, *Excited states), Energy levels, Energy levels, Hamiltonians, P states, S states, Strength functions.

For abstract, see NSA 28 02, number 05024.

INP-814/GA PC$3.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
MOESSBAUER ABSORPTION IN CALCIUM--IRON OLIVINES.
A. Z. Hrynkiewicz, D. S. Kulgawczuk, E. S. Mazanek, J. Wlasak, and M. E. Wyderko. Nov 72, 15p
U.S. Sales Only.

Descriptors: (*Olivines, *Moessbauer effect), Absorption, Calcium compounds, Crystal structure, Dielectric track detectors, High temperature, Iron compounds, Medium temperature, Quadrupoles.

For abstract, see NSA 28 02, number 05025.

ISSP-A-574/GA PC$3.50/MF$1.45
Tokyo Univ. (Japan). Inst. For Solid State Physics.
EFFECT OF SPIN FLUCTUATIONS ON ITINERANT ELECTRON FERROMAGNETISM. II.
T. Moriya, and A. Kawabata. Feb 73, 30p
U.S. Sales Only.

Descriptors: (*Ferromagnetic materials, *Spin), Electrons, Ferromagnetism, Free energy, Temperature dependence, Variations.

For abstract, see NSA 28 02, number 05033.

ITF-72-112-P/GA PC$3.50/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
DISPERSION OF LIGHT IN THE RANGE OF ABSORPTION BY IMPURITY CENTERS. II.
D. I. Oleksin, I. I. Fishuk, and 1972, 28p
In Russian. U.S. Sales Only.

Descriptors: (*Visible radiation, *Optical dispersion), (*Solids, *Impurities), Absorption, Lattice vibrations.

For abstract, see NSA 28 02, number 05031.

ITF-72-186-P/GA PC$3.25/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
APPLICATION OF A METHOD OF IRREDUCIBLE TENSOR OPERATORS TO THE INVESTIGATION OF ONE-PARTICLE ELECTRIC DIPOLE TRANSITIONS IN ANTIFERRODIELECTRICS.
E. G. Petrov, and V. N. Kharkyanen. 1972, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Antiferroelectric materials, *Energy-level transitions), (*Dielectric materials, Energy-level transitions), Dipoles, Excitation, Excited states, Ground states, Tensors.

For abstract, see NSA 28 03, number 07719.

ITF-72-88-P/GA PC$6.50/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
PECULIARITIES OF PHONON DISPERSION IN CRYSTAL WITH SUBSTITUTIONAL IMPURITIES.
I. P. Dzyub, and V. Z. Kochmarskii. 1972, 88p
In Russian. U.S. Sales Only.

Descriptors: (*Phonons, *Dispersions), (*Crystals, Phonons), Atoms, Crystal lattices, Cubic lattices, Impurities.

For abstract, see NSA 28 02, number 05029.

ITF-72-94-P/GA PC$4.50/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
MAGNON SIDE-BANDS THEORY OF EXCITON TRANSITIONS IN ANTIFERRODIELECTRICS.
E. G. Petrov. 1972, 46p
In Russian. U.S. Sales Only.

Descriptors: (*Antiferroelectric materials, *Energy-level transitions), (*Dielectric materials, Energy-level transitions), (*Excitons, Energy-level transitions), Brillouin zones, Magnons, Spin waves.

For abstract, see NSA 28 02, number 05030.

ITF-73-10-P/GA PC$3.50/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
LIGHT ABSORPTION BY CRYSTALS WITH SPACE DISPERSION.
A. S. Davydov, and A. A. Eremko. 1973, 28p
In Russian. U.S. Sales Only.

Descriptors: (*Visible radiation, *Absorption), (*Crystals, Visible radiation), Dielectric properties, Electromagnetic fields, Maxwell equations.

For abstract, see NSA 28 03, number 07722.

JINR-E4-6841/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ANALYTICAL AND NUMERICAL RESULTS OF THE HUBBARD MODEL IN SIMPLE APPROXIMATIONS.
K. Elk. 1972, 19p
U.S. Sales Only.

Descriptors: (*Solids, *Electronic structure), Crystal lattices, Electron correlation, Hartree-fock method.

For abstract, see NSA 28 02, number 03321.

JINR-P4-6985/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
CALCULATION OF THE ASPHERICITY OF MAGNETIC FORM FACTORS IN THE SYSTEM NI/SUB 1-X/FE/SUB X/ USING THE COHERENT POTENTIAL APPROXIMATION.
K. Elk. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Nickel alloys, *Magnetic properties), (*Iron alloys, Magnetic properties), Density.

For abstract, see NSA 28 03, number 07726.

JINR-P4-6998/GA PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ESTIMATE OF THERMODYNAMIC FUNCTIONS OF A FERROMAGNET WITH THE INTERACTION J/N.
I. G. Brankov. 1973, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Ferromagnetic materials, *Thermodynamic properties), Entropy, Field theories, Free energy, Interactions, Mathematics, Molecules.

For abstract, see NSA 28 02, number 05037.

JINR-P4-7000/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
MAGNETIZATION AND MAGNETIC SUSCEPTIBILITY OF AN ISING MODEL WITH THE INTERACTION J/N.
I. G. Brankov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Ferromagnetic materials, *Mathematical models), Field theories, Interactions, Magnetic properties, Magnetic susceptibility.

For abstract, see NSA 28 02, number 05038.

LBL-1108/GA PC$4.75/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
EVALUATION OF OPTIMAL PROCESS PARAMETERS FOR THE PRODUCTION OF SUPERCONDUCTING NIOBIUM--TIN TAPE IN RELATION TO PILOT PLANT DESIGN.
K. Hemachalam. Jun 72, 51p
Contract W-7405-eng-48

Descriptors: (*Niobium base alloys, *Superconductivity), (*Tin alloys, Superconductivity), Composite materials, Fabrication, Heat treatments, Powder metallurgy, Rolling, Sintering, Superconductors.

For abstract, see NSA 28 02, number 04013.

LBL-1125/GA PC$7.50/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
WAVELENGTH MODULATION SPECTROSCOPY OF SOME SEMICONDUCTORS AND METALS.
J. A. Stokes. Mar 73, 109p
Contract W-7405-eng-48

Descriptors: Copper, Gallium compounds, Gold, Indium compounds, Metals, Modulation, Phosphides, Semiconductor materials, Silver, Spectroscopy.

For abstract, see NSA 28 03, number 07736.

LNF-72/104/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
MEAN LIFE ON PERSISTENT CURRENT IN TWO DIMENSIONAL SUPERCONDUCTOR.
G. Parisi. 7 Dec 72, 3p
U.S. Sales Only.

Descriptors: (*Superconductors, *Electric currents), Ginzburg-landau theory, Lifetime, Time dependence, Two-dimensional calculations.

For abstract, see NSA 28 02, number 03984.

N73-27156/1GA PC$9.75/MF$1.45
Societe Europeenne de Semiconducteurs et de Microelectronique, Paris (France). Lab. de Recherches.

PHYSICAL PHENOMENA OCCURRING IN CHARGE TRANSFER DEVICES ETUDE DES PHENOMENES PHYSIQUES INTERVENANT DANS LES DISPOSITIFS A TRANSFERT DE CHARGE COMPTE RENDU FINAL.
Final Report.
R. Poirier, N. Szydlo, J. Olivier, and L. E. N. Lakous. 14 Dec 71, 153p
Contract DRME-70/34.388.09.480.75.01
Language in French.

Descriptors: *Charge transfer, *Electrical properties, *Solid-solid interfaces, Dielectrics, Electron beams, Image transducers, Metal surfaces, Semiconductors (Materials), Silicon.

For abstract, see STAR 1118

N73-28574/4GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
EFFECT OF IRRADIATION ON THE ABSOLUTE THERMAL EMF OF METALS AND ALLOYS.
A. A. Adamenko, I. Y. Dekhtyar, and A. M. Shalayev. Aug 73, 12p NASA-TT-F-15015
Contract NASW-2485
Tran-Transl. Into English from Fiz. Metal. I Metalloved. (Ussr), V. 34, No. 3, Sep. 1973 p 464-469.

Descriptors: *Electromotive forces, *Irradiation, *Metals, *Thermoelectricity, Alloys, Alpha particles, Deuterons, Fast neutrons.

For abstract, see STAR 1119

N73-28715/3GA PC$4.00/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Electrical Engineering.
A THIN POLYMER INSULATOR FOR JOSEPHSON TUNNELING APPLICATIONS.
Final Report.
C. M. Wilmsen. Jul 73, 38p NASA-CR-121270
Contract NGR-06-002-094

Descriptors: *Barrier layers, *Josephson junctions, *Polymers, Organic materials, Superconductivity, Thin films, Transition temperature.

For abstract, see STAR 1119

N73-28716/1GA PC$9.25/MF$1.45
Cornell Univ., Ithaca, N.Y. Materials Science Center.
STRUCTURE AND ENHANCED SUPERCONDUCTIVITY OF EVAPORATED ALUMINUM FILMS.
Ph.D. Thesis.
R. B. Pettit. Aug 72, 144p NASA-CR-133450, COO-3156-53
Subm-Sponsored Jointly by NASA, AEC and ARPA.

Descriptors: *Crystal structure, *Grain boundaries, *Metal films, *Transition temperature, Aluminum, Particle size distribution, Superconductivity, Surface reactions.

For abstract, see STAR 1119

N73-28850/8GA PC$4.00/MF$1.45
Alabama Univ., Huntsville. School of Graduate Studies and Research.
ATOM BEAM SURFACE INTERACTION STUDIES: EXPERIMENTAL SYSTEM DEVELOPMENT.
Final Report.
J. C. Gregory. Jun 73, 36p NASA-CR-124309
Contract NAS8-28071

Descriptors: *Adsorption, *Carbon, *Deposition, *Silicon, Auger effect, Beams (Radiation), Electrophotometry, Spectroscopy.

For abstract, see STAR 1119

RLO-2225-T-13-14/GA PC$5.45/MF$1.45
Washington Univ., Seattle. Coll. Of Engineering.
STUDY OF PHASE TRANSFORMATIONS AND SUPERCONDUCTIVITY. ANNUAL PROGRESS REPORT.
D. H. Polonis. 15 Oct 72, 58p
Contract AT(45-1)-2225

Descriptors: Phase transformations, Superconductivity.

For abstract, see NSA 28 03, number 06904.

SLA-73-211/GA PC$4.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SHOCK AND RELEASE BEHAVIOR IN POROUS 1100 ALUMINUM.
J. R. Asay. Apr 73, 52p

Descriptors: (*Aluminium alloys, *Impact shock), Compacting, Equations of state, Lasers, Measuring instruments, Plates, Porosity, Quartz, Relaxation, Stresses.

For abstract, see NSA 28 03, number 07783.

SLA-73-230/GA PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ION IMPLANTATION DEPOSITION OF ENERGY INTO ELECTRONIC PROCESSES IN SILICON AND GERMANIUM TARGETS.
D. K. Brice. Mar 73, 46p

Descriptors: (*Silicon, *Ion implantation), (*Germanium, Ion implantation), Deposition, Elastic scattering, Energy spectra, Heavy ions, Ion beams, Kev range 10-100, Kev range 100-1000.

For abstract, see NSA 28 03, number 06368.

SRARI-P-163/GA PC$3.00/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
MACROSCOPIC MODEL OF SWELLING OF IRRADIATED SOLIDS.
L. D. Ivanov. 1972, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Solids, *Physical radiation effects), (*Swelling, *Functional models), Stresses, Volume.

For abstract, see NSA 28 02, number 03033.

SRARI-P-173/GA PC$3.25/MF$1.45
Scientific Research Inst. Of Atomic Reactors, Dimitrovgrad (Ussr).
X-RAY ANALYSIS OF RADIATION DAMAGE IN NONMETALLIC MATERIALS.
V. M. Kosenkov. 1972, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Nonmetals, *Physical radiation effects), (*Solids, Physical radiation effects), (*Crystals, Physical radiation effects), Photon beams, Reviews, X-ray diffraction.

For abstract, see NSA 28 02, number 03032.

TP-388/GA PC$5.75/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
GREEN FUNCTION METHOD FOR THE CALCULATION OF DISTORTION AROUND A POINT DEFECT IN A CRYSTAL LATTICE.
V. K. Tewary. Dec 69, 71p
U.S. Sales Only.

Descriptors: (*Copper, *Point defects), (*Crystal lattices, Point defects), Born-von karman theory, Deformation, Green function, Numerical solution.

For abstract, see NSA 28 03, number 07830.

20M. Thermodynamics

AD-767 413/8GA Reprint
Stanford Univ Calif Inst of Theoretical Physics
FREE SURFACE OF A ROTATING SUPERFLUID,
Kenneth C. Harvey, and Alexander L. Fetter. 15 Nov 72, 11p Rept no. ITP-422-29Q AFOSR-TR-73-1727
Contract F44620-71-C-0044
Availability: Pub. in Jnl. of Low Temperature Physics, v11 n3/4 p473-481 1973.

Descriptors: (*Superfluidity, Vortices), Cryogenics, Liquefied gases, Helium, Hydrodynamics, Surfaces.
Identifiers: Helium 4, Helium 3, Liquid helium.

The free-surface profile near a perpendicular rectilinear vortex is studied with classical hydrodynamics. Numerical values and approximate analytic expressions are derived. For pure 4He at T = O K, the dimple has a depth approximately = 69.5A and a radius approximately = 42,600 A at half depth. The addition of 3He impurities increases the central depth. Possible detection of vortex lines with phase-contrast techniques is discussed. (Author)

COM-73-11464/7GA PC$4.50/MF$1.45
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
FORCED CONVECTION HEAT TRANSFER TO SUBCRITICAL HELIUM I.
Final rept.,
Patricia J. Giarrantano, R. C. Hess, and M. C. Jones. May 73, 46p NBSIR-73-322 AFAPL-TR-73-37
Contract AT(49-2)-1165

Descriptors: (*Liquid helium, Heat transfer), Experimental design, Heat flux, Pressure measurement, Flow measurement, Subcritical flow.

Preliminary results of an experimental investigation of heat transfer to liquid helium under forced flow conditions are reported for a 0.213 cm i.d. x 10 cm long test section. The effect of the system parameters on the heat transfer and critical heat flux is discussed; a comparison of forced convection boiling with other modes of heat transfer (pool boiling and supercritical) and the performance of a centrifugal pump used for circulating the liquid helium are also included in the report.

N73-27797/2GA PC$9.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HEAT FLOW AND CONVECTION DEMONSTRATION (APOLLO 14).
T. C. Bannister. 29 Mar 73, 139p NASA-TM-X-64735

Descriptors: *Gases, *Heat transfer, *Heat transmission, *Liquids, Apollo 14 flight, Interfacial tension, Weightlessness.

For abstract, see STAR 1118

N73-27801/2GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THERMAL CONDUCTIVITY OF PARTICULATE MATERIALS: A SUMMARY OF MEASUREMENTS TAKEN AT THE MARSHALL SPACE FLIGHT CENTER.
J. A. Fountain. 20 Apr 73, 72p NASA-TM-X-64759

Descriptors: *Basalt, *Materials tests, *Particulate sampling, *Temperature measurement, *Thermal conductivity, Curve fitting, Data acquisition, Numerical analysis, Temperature effects, Test equipment, Thermodynamic properties.

For abstract, see STAR 1118

N73-27868/7GA PC$3.00/MF$1.45
Kentucky Univ., Lexington.
EXTENDED HYDRODYNAMIC THEORY OF THE PEAK AND MINIMUM POOL BOILING HEAT FLUXES.
J. H. Linehard, and V. Dhir. Jul 73, 195p NASA-CR-2270
Contract NGL-18-001-035

Descriptors: *Film boiling, *Heat flux, *Heat generation, *Heating equipment, Electrolysis, Materials tests, Reduced gravity, Thermodynamic properties.

For abstract, see STAR 1118

N73-28153/7GA PC$14.25/MF$1.45
National Bureau of Standards, Boulder, Colo.
CAVITATION IN LIQUID CRYOGENS. 3: OGIVES.
J. Hord. May 73, 244p NASA-CR-2242
NASA ORDER C-39004-B

Descriptors: *Cavitation flow, *Liquid hydrogen, *Liquid nitrogen, *Ogives, Cryogenics, Graphs (Charts), Tables (Data).

For abstract, see STAR 1119

N73-28914/2GA PC$3.25/MF$1.45
Weapons Research Establishment, Salisbury (Australia).
A COMPUTER PROGRAM TO SOLVE THE ONE DIMENSIONAL HEAT CONDUCTION PROBLEM USING THE HOPSCOTCH ALGORITHM.
R. L. Pope, and N. F. Mack. Mar 73, 23p WRE-TN-884(WR/D)

Descriptors: *Aerodynamic heating, *Computer programs, *Heat transmission, Algorithms, Numerical analysis, Problem solving, Thermodynamic properties.

For abstract, see STAR 1119

N73-28915/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NET RADIATION METHOD FOR ENCLOSURE SYSTEMS INVOLVING PARTIALLY TRANSPARENT WALLS.
R. Siegel. Aug 73, 33p NASA-TN-D-7384, E-7363

Descriptors: *Radiative heat transfer, *Solar collectors, *Transparence, Absorptivity, Transmissivity, Windows (Apertures).

For abstract, see STAR 1119

N73-28916/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN INTERATIVE SOLUTION OF AN INTEGRAL EQUATION FOR RADIATIVE TRANSFER BY USING VARIATIONAL TECHNIQUE.
K. K. Yoshikawa. Aug 73, 29p NASA-TN-D-7292, A-4774

Descriptors: *Iterative solution, *Nonlinear equations, *Radiative heat transfer, Atmospheric radiation, Integral equations, Variational principles.

For abstract, see STAR 1119

N73-28921/7GA PC$6.25/MF$1.45
General Electric Co., Utica, N.Y. Aerospace Electronic Systems Dept.
AN EFFICIENT NUMERICAL TECHNIQUE FOR CALCULATING THERMAL SPREADING RESISTANCE.
Final Report.
E. H. Gale, Jr.. 8 Feb 73, 84p NASA-CR-12412
Contract NAS8-28516

Descriptors: *Numerical analysis, *Thermal resistance, Computer programs, Electronic equipment, Fortran, Temperature profiles, Thermal boundary layer.

For abstract, see STAR 1119

ORO-3911-4/GA PC$4.50/MF$1.45
North Carolina State Univ., Raleigh.
INVESTIGATION OF THE DYNAMICS OF NUCLEATE BOILING. FINAL REPORT.
R. F. Saxe. 18 Dec 72, 48p
Contract AT(40-1)-3911

Descriptors: (*Nucleate boiling, *Sodium), Bubble growth, Mechanics, Sound waves.

For abstract, see NSA 28 02, number 02508.

PATENT-3,745,816/GA Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ABLATION ARTICLE AND METHOD.
Patent.
W. D. Erickson, and E. M. Sullivan. Patented 17 Jul 73, 5p NASA-CASE-LAR-10439-1, Misc-Filed 20 Sep. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Ablative materials, *Surface properties, *Transition flow, Patents, Radiation.

An ablation article, such as a conical heat shield, having an ablating surface is provided with at least one discrete area of at least one seed material, such as aluminum. When subjected to ablation conditions, the seed material is ablated. Radiation emanating from the ablated seed material is detected to analyze ablation effects without disturbing the ablation surface. By providing different seed materials having different radiation characteristics, the ablating effects on various areas of the ablating surface can be analyzed under any prevailing ablation conditions. The ablating article can be provided with means for detecting the radiation characteristics of the ablated seed material to provide a self-contained analysis unit.

RHEL/R-258/GA PC$3.75/MF$1.45
Rutherford High Energy Lab., Chilton (England).
INDIRECT COOLING OF A SUPERCONDUCTING MAGNET USING SUPERCRITICAL HELIUM.
R. L. Bailey, B. Colyer, and G. J. Homer. Dec 72, 34p
U.S. Sales Only.

Descriptors: (*Superconducting magnets, *Cooling), Heat exchangers, Helium ii, Quadrupoles, Ultralow temperature.

For abstract, see NSA 28 03, number 06497.

RT/ING-(72)19/GA PC$17.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ADVANCES IN HEAT TRANSFER.
16 Oct 72, 296p
U.S. Sales Only.

Descriptors: (*Two-phase flow, Heat transfer), (*Burnout, Heat transfer), (*Boiling, Heat transfer), (*Heat transfer, *Reviews).

For abstract, see NSA 28 02, number 02509.

TID-26335/GA PC$13.75/MF$1.45
Illinois Univ., Urbana.
SUBCOOLED FORCED CONVECTION FILM BOILING IN A VERTICAL ANNULUS.
W. P. Barnes. 19 Jan 73, 234p

Descriptors: (*Film boiling, *Heat transfer), Annular space, Forced convection, Stability, Subcooled boiling, Water.

For abstract, see NSA 28 03, number 05469.

20N. Wave Propagation

AD-767 186/8GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
STATISTICAL ANALYSIS OF SHORTWAVE FADEOUT OCCURRENCE FOR THE YEARS 1955 TO 1969.
Environmental research papers,
Richard G. Hendl, and Robert A. Skrivanek. 28 Jun 73, 20p Rept nos. AFCRL-ERP-452, AFCRL-TR-73-0385

Descriptors: (*Radiofrequency interference, Solar flares), Blackout(Electromagnetic), Correlation techniques.

Shortwave fadeout data for the period 1955 through 1969 were analyzed and correlated with solar flare data for the same period. Details of the analysis are presented along with various statistical presentations of the data. The validity of computerized objective procedures for matching geophysical data is shown. Some doubt is cast on the quality of the shortwave fadeout data during the early part of the period considered. (Author)

AD-767 187/8GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
CORRELATIONS OF SOLAR AND GEOPHYSICAL PARAMETERS-SHORTWAVE FADEOUTS AND SOLAR OPTICAL FEATURES.
Environmental research papers,
Ronald T. Podsiadlo. 12 Jul 73, 14p Rept nos. AFCRL-ERP-453, AFCRL-TR-73-0411

Descriptors: (*Radiofrequency interference, Solar disturbances), Blackout(Electromagnetic), Correlation techniques.

Shortwave fadeout durations are compared with associated solar flare characteristics and other features of the solar regions in which the flares occur. Statistical tests show that flare parameters, especially flare importance, have the highest correlations with shortwave fadeout duration. Most other active region features, such as plage area, also show some correlation, but to varying lesser degrees. Cross tabulations of the shortwave fadeout durations and optical features are presented and discussed relative to their use as operational space forecasting aids. (Author)

AD-767 478/1GA Reprint
Illinois Univ Chicago Dept of Information Engineering
NUMERICAL AND ASYMPTOTIC SCATTERING FROM TWO INHOMOGENEOUS LENSES,
S. R. Laxpati, and P. L. E. Uslenghi. 12 Apr 73, 5p AFOSR-TR-73-1863
Grant AF-AFOSR-2263-72
Availability: Pub. in Jnl. Applied Physics, v2 p11-14 1973.

Descriptors: (*Electromagnetic lenses, Scattering), High frequency, Electromagnetic waves.
Identifiers: Electromagnetic scattering, Geometrical optics, Ray tracing, WKB approximation.

The scattering of a time-harmonic, plane electromagnetic wave by either a Maxwell fish-eye or a metal-like lens is considered. Numerical values of the monostatic cross sections are obtained by evaluating the exact, infinite series solution of

hypergeometric functions of the 2F1 type. These results are compared with the high-frequency asymptotic estimates based on either geometrical optics or a modified Watson transformation. (Author)

AD-767 657/0GA PC$6.25/MF$1.45
Naval Postgraduate School Monterey Calif
HIGH FREQUENCY PROPAGATION ANOMALIES.
Master's thesis,
Daniel Victor Stapleton, Jr. Jun 73, 84p

Descriptors: (*Radio transmission, Anomalies), High frequency, Data, Analysis, Computer programs, Theses.
Identifiers: Interactive computer graphics, Brigham project, Signal processing, AN/FLR-15, AN/FRD-10.

A search was made for propagation anomalies using a large quantity of high frequency data produced as a byproduct of BRIGHAM, a Department of Defense project. The BRIGHAM data is based on 800 KHz wide samples of the HF spectrum at a 25 cycle rate, using a 2.8 KHz resolution for a duration of approximately 2.5 minutes. This method of data collection is unique and it was hoped that propagation anomalies, including wide band anomalies, might be detected. Anomalies are believed to occur in the propagation of radio signals and they are usually other than known, routine effects but may include known effects which cannot adequately be explained. The scope of the examination was limited to the visual analysis of computer processed data presented on an interactive graphics unit. (Author)

SLA-73-338/GA PC$3.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
CALCULATION OF SPECTRA FROM EMP-TYPE WAVEFORMS.
C. N. Vittitoe. Mar 73, 34p

Descriptors: (*Electromagnetic radiation, *Pulses), Fourier transformation, Spectra.

For abstract, see NSA 28 02, number 05071.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

COM-73-50815/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
EXTINCTION OF FIRES BY HALOGENATED COMPOUNDS--A SUGGESTED MECHANISM.
Final rept.,
E. C. Creitz. 1972, 11p
Pub. in Fire Technol., v8 n2 p131-141 May 72.

Descriptors: (*Diffusion flames, *Combustion inhibitors), (*Halogen organic compounds, Combustion inhibitors), (*Fire extinguishing agents, Halogen organic compounds), Oxygen, Carbon monoxide, Combustion, Recombination reactions.
Identifiers: Chemical reaction mechanisms.

It is suggested that halogenated compounds extinguish diffusion flames by promoting recombination of reactive oxygen atoms to form less reactive molecular oxygen. Oxygen atoms are important in the branching steps of the hydrogen-oxygen chain reaction. For a fuel containing carbon, CO is an intermediate product which appears in the region in which inhibition takes place. Inhibition of its oxidation appears to take place because of the paucity of hydroxyl radicals which are a product of the hydrogen-oxygen chain reaction. The mechanism is suggested in an attempt to rationalize a number of apparently disparate observations reported in the literature of both normal and inhibited flames. Data in support of the suggested mechanism are discussed.

N73-27804/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TURBOJET EMISSIONS, HYDROGEN VERSUS JP.
J. Grobman, C. Norgren, and D. Anderson. 1973, 22p NASA-TM-X-68258, E-7539
Conf-Presented at Working Symp. On Liquid-Hydrogenfueled Aircraft, Langley, VA., 15-16 May 1973.

Descriptors: *Combustion products, *Exhaust gases, *Jet engine fuels, *Turbojet engines, Combustion efficiency, Hydrogen, Nitrogen oxides.

For abstract, see STAR 1118

N73-27807/9GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HANDBOOK OF INFRARED RADIATION FROM COMBUSTION GASES.
C. B. Ludwig, W. Malkmus, J. E. Reardon, J. A. L. Thomson, and R. Goulard. 1973, 497p NASA-SP-3080

Descriptors: *Exhaust gases, *Heat generation, *Infrared radiation, *Rocket engines, *Turbojet engines, Combustion products, Rocket engine design, Temperature effects.

For abstract, see STAR 1118

N73-28919/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AFTERBURNER PERFORMANCE OF FILM-VAPORIZING V-GUTTERS FOR INLET TEMPERATURES UP TO 1255 K.
J. R. Branstetter, and G. M. Reck. Aug 73, 26p NASA-TM-X-2855, E-7435

Descriptors: *Afterburning, *Combustion efficiency, *Combustion physics, *Flame holders, *Fuel sprays, Equipment specifications, Fuel-air ratio, Performance tests, Thermodynamic properties.

For abstract, see STAR 1119

21C. Electric Propulsion

AD-767 601/8GA PC$8.75/MF$1.45
TRW Systems Group Redondo Beach Calif
ANNULAR COLLOID THRUSTER FOR THREE-AXIS STABILIZED MILITARY SATELLITES.
Technical rept. 15 Nov 71-1 Apr 73,
Marshall N. Huberman. Jun 73, 134p AFRPL-TR-73-39
Contract F04611-72-C-0018

Descriptors: (*Plasma engines, Design), (*Military satellites, Space propulsion), Colloids, Attitude control systems, Rocket motors, Thrust, Specific impulse, Plasma medium, Ion engines.
Identifiers: Colloid thrusters, Stationkeeping.

The report describes a program to increase the performance capability of high thrust density colloid thrusters. Single emitter sources have been developed which produce greater than 25 micro lbs thrust at 75 percent efficiency and 1300 seconds specific impulse as measured by time-of-flight techniques. Multi-source modules were also built and successfully tested in the 100 micro lb range for periods of the order of 100 hours. The ability to maintain constant performance within plus or minus 3 percent was also demonstrated. Beam probe measurements indicated that 90 percent of the propellant exhaust was contained with a 15 degree half angle. Lithium iodide and potassium iodide doped glycerol solutions were briefly looked at as candidate propellants with no performance improvements observed. Also the ability of an antistatic additive to induce electrical conductivity in a low vapor pressure pump oil was investigated with negative results. New evaporation rate measurements made with pure glycerol showed that the sodium iodide/glycerol evaporation rate was 40 percent below that of pure glycerol. Furthermore the measured results showed that the evaporated mass loss at typical operating temperatures would be of the order of one percent of the nominal thruster operating mass flow. (Modified author abstract)

N73-27702/2GA PC$6.00/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
MONOPROPELLANT HYDRAZINE RESISTOJECT: ENGINEERING MODEL FABRICATION AND TEST TASK.
Summary Report.
C. K. Murch. Mar 73, 76p NASA-CR-132784, TRW-20266-6024-RO-00
Contract NAS5-11477

Descriptors: *Hydrazines, *Monopropellants, *Rocket engines, Performance tests, Specifications, Systems engineering.

For abstract, see STAR 1118

N73-27708/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NATURAL ENVIRONMENT DESIGN REQUIREMENTS FOR THE SOLAR ELECTRIC PROPULSION STAGE (SEPS).
L. E. Andrews. 24 Jul 73, 12p NASA-TM-X-64761

Descriptors: *Engine design, *Equipment specifications, *Solar electric propulsion, *Space shuttles, Low thrust propulsion, Propulsion system configurations, Systems analysis.

For abstract, see STAR 1118

N73-28736/9GA PC$6.75/MF$1.45
Hughes Research Labs., Malibu, Calif.
PERFORMANCE OPTIMIZED, SMALL STRUCTURALLY INTEGRATED ION THRUSTER SYSTEM.
J. Hyman, Jr.. May 73, 92p NASA-CR-121183
Contract NAS3-15483

Descriptors: *Engine design, *Ion engines, *Ion propulsion, *Satellite attitude control, *Stationkeeping, Equipment specifications, Performance tests, Product development, Systems analysis.

For abstract, see STAR 1119

N73-28944/9GA PC$3.00/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
STRATEGY OF SPACE RESEARCH.
H. Alfven. 1972, 10p TRITA-EPP-72-08
Conf-Presented at the Lomonosov Meeting, Moscow, Mar. 1972.

Descriptors: *Manned space flight, *Plasma propulsion, *Solar system, Planetary evolution, Solar wind.

For abstract, see STAR 1119

PATENT-3 744 247/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SINGLE GRID ACCELERATOR FOR AN ION THRUSTOR.
Patent.
P. M. Margosian, and S. Nakanishi. Patented 10 Jul 73, 4p NASA-CASE-XLE-10453-2, Misc-Field 14 Sep. 1971. Subm-Continued-in-Part of Abandoned US Patent Appl. Sn-758540, Filed 9 Sep. 1968.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Acceleration, *Electron bombardment, *Ion engines, Dielectrics, Propulsion system configurations.

A single grid accelerator system for an ion thrustor is discussed. A layer of dielectric material is interposed between this metal grid and the chamber containing an ionized propellant for protecting the grid against sputtering erosion.

21D. Fuels

AD-767 591/1GA PC$3.00/MF$1.45
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
JP-4 THERMAL STABILITY SURVEY.
Final rept. Jun 71-Aug 72,
Jerry C. Ford, Royce P. Bradley, and Leonard C. Angello. Jun 73, 35p Rept no. AFAPL-TR-73-27

Descriptors: (*Jet engine fuels, Thermal stability), Specifications.
Identifiers: *JP-4 fuel, Coking.

A survey was conducted to determine the thermal stabilities of JP-4 fuels produced by refineries in the United States. The effect on fuel availability of increasing the test conditions of the JP-4 specification from 300/400F to 325/425F was determined to be minimal provided a precise method of measuring thermal stability is available. Physical properties on the 19 JP-4 fuels are documented. (Modified author abstract)

PATENT-3 727 049/GA Not available NTIS
Department of the Navy Washington D C
METHOD FOR DETERMINING IMMISCIBLE WATER CONTENT OF FLUIDS BY SPECTROPHOTOMETER.
Patent,
Raymond A. Saunders. Filed 1 May 67, patented 10 Apr 73, 8p Rept nos. PAT-APPL-635 974,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Fuel oil, *Moisture), (*Patents, Fuel oil), Solvents, Chemical analysis, Organic compounds, Armed forces supplies, Hydrocarbons, Spectrophotometers, Infrared spectroscopy.
Identifiers: PAT-CL-250-43-5-R, Spectrophotometry, Furan/tetrahydro, Morpholine/N ethyl, Ether/bis(2 ethoxyl ethyl).

The purpose of this invention is to facilitate the spectral determination of undesirable water dispersed in an immiscible fluid by forming a solution through the addition of a third component in which the components of the immiscible system are mutually and simultaneously soluble. A specific application of this invention is the quantitative determination of water in Navy Special fuel oil. Examples of suitable solvents to solubilize the immiscible fuel are N-ethyl morpholine, tetrahydrofuran, bis(2-ethoxy ethyl) ether and mixtures thereof, although not necessarily limited thereto.

21E. Jet and Gas Turbine Engines

AD-767 241/3GA PC$14.25/MF$1.45
Creare Inc Hanover N H
MODELING A HIGH-PRESSURE-RATIO CENTRIFUGAL COMPRESSOR USING A LOW-SPEED-OF-SOUND GAS.
Final rept.,
James A. Block, and Peter W. Runstadler, Jr. May 73, 245p USAAMRDL-TR-73-18
Contract DAAJ02-70-C-0022

Descriptors: (*Centrifugal compressors, Aerodynamics), (*Gas turbines, Centrifugal compressors), Wind tunnel models, Impellers, Subsonic flow, Specific heat, Numerical analysis, Instrumentation, Feasibility studies.
Identifiers: Turbomachinery, Low speed modeling, Low speed wind tunnels.

The results of a program are presented which demonstrate that low-speed-of-sound modeling is a practical tool for the research and development of high-pressure-ratio, high-speed centrifugal compressors. The compressor air performance and the details of its internal fluid dynamics were replicated at reduced rotational speed when a low-speed-of-sound gas was used, providing inlet Mach number, Reynolds number, and gas specific heat ratio were duplicated. Duplication of inlet specific heat ratio was essential to accurate modeling of the air-equivalent flow rate. Stage pressure ratio and stage efficiency were found to be less sensitive to the accurate replication of air-equivalent inlet specific heat ratio. (Modified author abstract)

AD-767 265/2GA PC$3.50/MF$1.45
Cincinnati Univ Ohio Dept of Aerospace Engineering
OFF-DESIGN BEHAVIOR FOR AXIAL FLOW COMPRESSOR STAGES WITH INVARIABLE AND VARIABLE GEOMETRY BLADES,
K. Grahl, and W. Tabakoff. Sep 73, 67p Rept no. 73-39 AROD-10223:6-E
Grant DA-ARO(D)-31-124-G154

Descriptors: (*Axial-flow compressors, Aerodynamics), Cascade structures, Jet engines, Stability, Performance(Engineering), Optimization, Guide vanes, Mathematical models.
Identifiers: Computer aided analysis, Computerized simulation, Design criteria.

An application of a computer program is described for studying the off-design performance for single and multistage axial flow compressors. The calculation method allows one to determine the stage characteristics as a function of revolutions. This can be accomplished in a very short time with only a few geometrical and aerodynamical input data. The flow is described by the well-known streamline curvature method. The necessity of a good loss model is shown. Limitations of this method are described. Some computation examples for the first and fifth stages of a ten-stage NASA axial flow compressor are presented. The stage and overall characteristics for different compressors are considered for invariable and variable blade geometry. The off-design analytical results are compared with existing experimental results. (Author)

AD-767 266/0GA PC$3.00/MF$1.45
Cincinnati Univ Ohio Dept of Aerospace Engineering
A NUMERICAL SOLUTION FOR THE HEAT TRANSFER BETWEEN AN AXI-SYMMETRIC AIR JET AND A HEATED PLATE,
R. Ravuri, and W. Tabakoff. Sep 73, 35p Rept no. 73-38 AROD-T-4:57-E
Contract DAHC04-69-C-0016

Descriptors: (*Jets, Axially symmetric flow), (*Gas turbines, Cooling), (*Heat transfer, Partial differential equations), Heat flux, Axial-flow compressor blades, Stagnation point, Temperature, Mathematical models, Programming(Computers).
Identifiers: Finite difference theory, Numerical integration.

Due to their characteristic high rate of heat transfer, impinging air jets are being used extensively in industry. A numerical scheme is devised to predict the heat transfer between an axi-symmetric air jet and a heated plate, neglecting the effect of curvature, compressibility, and turbulence. The momentum and continuity equations are transformed to vorticity and stream function equations and are then solved by iterative successive substitution techniques to determine the flow field and subsequently the temperature distribution in the fluid. An attempt is made to predict the average heat transfer coefficient of a row of axi-symmetric air jets impinging on a heated plate by assuming that each jet cools a fraction of the plate without any interference from the neighboring jets. (Author)

AD-767 337/9GA PC$3.00/MF$1.45
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
RESEARCH ON NOISE GENERATED BY DUCTED AIR-FUEL COMBUSTION SYSTEMS.
Annual rept. no. 2, 1 Mar 72-28 Feb 73,
Edelbert G. Plett, H. H. Chiu, and Martin Summerfield. Mar 73, 31p
Contract N00014-67-A-0151-0029
See also Annual rept. no. 1 dated 1 Mar 72, AD-754 094.

Descriptors: (*Jet engine noise, Sources), Ducted bodies, Afterburners, Combustion, Turbulence, Mathematical models, Bibliographies.
Identifiers: Noise generation.

A two-pronged approach to the study of noise generation by combustion in a confined flow system, similar to a jet engine configuration, is described. One aspect deals with the mechanisms of noise generation by combustion; the other aspect deals with the effect of confinement on the noise generation and radiating properties of an unsteady solid-body-flow interaction. The mechanisms of noise generation by combustion are being studied analytically. It is noted that the steady flame structure determine the basic thermodynamic properties such as the sound speed and distribution of heat release, which affect amplification, dispersion and propagation of sound. The non-steady flame characteristics are responsible for noise generation; the turbulent scale, period and intensity affect the burning rate and heat release rate. The overall noise generation character is a superposition of the steady and non-steady acoustic characteristics. In studies with ducted and non-ducted sources, it is found that the interaction between the duct and the noise source can enhance the noise generation potential of the source region. The noise due to unsteady flow over small struts inside a duct is found to overwhelm the free jet noise up to speeds in excess of 1000 ft/sec. (Author)

AD-767 425/2GA PC$3.00/MF$1.45
United Aircraft Research Labs East Hartford Conn
DEVELOPMENT OF OPTIMAL CONTROL MODES FOR ADVANCED TECHNOLOGY PROPULSION SYSTEMS.
Interim technical rept. 1 Feb-30 Jun 73,
Gerald J. Michael, and Florence A. Farrar. Aug 73, 36p Rept no. UARL-M911620-1
Contract N00014-73-C-0281

Descriptors: (*Turbofan engines, *Adaptive control systems), (*Short take-off planes, Hovering), Fuel meters, Turbine parts, Compressor parts, Inlet guide vanes, Thrust, Afterburners, Optimization.
Identifiers: Feedback control, F-401 engines.

A nonlinear multivariable feedback controller was developed for the V/STOL hover application (80 to 100 percent thrust range) of the Pratt and Whitney Aircraft F401 variable cycle turbofan engine. The analytical design involved (1) linearizing the F401 engine dynamics about two closely-spaced, steady-state operating points and applying linear optimization methods at each point, and (2) combining two optimal linear controllers into a single nonlinear controller having feedback gains that vary with system state. Variable fan, compressor, and exhaust geometries and changes in main burner fuel flow rate are coordinated by the controller to achieve improved engine dynamic response. Responses with the optimal controller were computed using a nonlinear digital simulation of the engine. The engine response evaluated was for a commanded thrust change from the V/STOL hover setting (80 percent) to military rated thrust (100 percent). These responses were compared with those obtained using a state-of-the-art conventional controller designed to provide rapid thrust response (the P and WA) fast accel controller). (Modified author abstract)

AD-767 656/2GA PC$8.75/MF$1.45
Naval Postgraduate School Monterey Calif
EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF TIP CLEARANCE AND END LOSSES ON AXIAL COMPRESSOR PERFORMANCE.
Master's thesis,
John Kirtland Welch. Jun 73, 135p

Descriptors: (*Axial-flow compressor blades, Fluid flow), (*Gas turbines, *Axial-flow compressors), Compressor rotors, Calibration, Torque, Flow fields, Mathematical models, Computer programs, Theses.
Identifiers: Turbomachinery.

The objective of the study was to determine by experimental means the rotor efficiencies at different radii between hub and tip of a single stage axial compressor at its design point, to show the influence of tip clearance and end losses. Procedures for calibration and application of pressure probes to survey the flow in the compressor were established and programs were written to analyze the measured data. Recommendations are made for improvements of the data reduction method, which should precede experiments involving controlled changes in the blade tip clearances. (Author)

N73-27592/7GA PC$3.25/MF$1.45
National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
FAR FIELD RADIATION OF ROTOR-STATOR INTERACTION TONES FROM AN ANNULAR DUCT.
G. Krishnappa, and L. R. Jones. Apr 73, 25p NRC-13260, LR-568

Descriptors: *Ducted fans, *Noise generators, *Rotor blades, *Sound propagation, Noise propagation, Numerical analysis.

For abstract, see STAR 1118

N73-27704/8GA PC$7.25/MF$1.45
Pratt and Whitney Aircraft, East Hartford, Conn.
STUDY OF UNCONVENTIONAL PROPULSION SYSTEM CONCEPTS FOR USE IN A LONG RANGE TRANSPORT.
G. A. Champagne. Aug 73, 104p NASA-CR-121242, PWA-4692
Contract NAS3-15550

Descriptors: *Aerodynamic noise, *Propulsion system configurations, *Subsonic speed, *Transport aircraft, Acoustic properties, Noise reduction, Propulsion system performance, Systems analysis.

For abstract, see STAR 1118

N73-27707/1GA PC$9.50/MF$1.45
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
EXPERIMENTAL QUIET ENGINE PROGRAM. PREDICTED ENGINE PERFORMANCE.
Feb 73, 148p NASA-CR-121258
Contract NAS3-12430
Misc-Revised.

Descriptors: *Engine design, *Engine noise, *Jet aircraft noise, *Noise reduction, *Turbofan engines, Data acquisition, Data processing, Flight tests, Propulsion system performance.

For abstract, see STAR 1118

N73-27709/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DYNAMIC RESPONSE OF MACH 2.5 AXISYMMETRIC INLET WITH 40 PERCENT SUPERSONIC INTERNAL AREA CONTRACTION.
R. J. Baumbick, R. E. Wallhagen, G. H. Neiner, and P. G. Batterton. Jul 73, 20p NASA-TM-X-2833, E-7426

Descriptors: *Dynamic response, *Supersonic inlets, *Turbofan engines, Mach number, Static pressure, Supersonic compressors.

For abstract, see STAR 1118

N73-27798/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARISON OF TEMPERATURE DATA FROM AN ENGINE INVESTIGATION FOR FILM-COOLED AND NON-FILM-COOLED, PANWISE-FINNED VANES INCORPORATING IMPINGEMENT COOLING.
D. J. Gauntner. Jul 73, 28p NASA-TM-X-2819, E-7386

Descriptors: *Cooling systems, *Temperature profiles, *Vanes, Film cooling, Heat transfer, Turbojet engines.

For abstract, see STAR 1118

N73-28734/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLIGHT INVESTIGATION OF ACOUSTIC AND THRUST CHARACTERISTICS OF SEVERAL EXHAUST NOZZLES INSTALLED ON UNDERWING NACELLES ON AN F106 AIRPLANE.
R. R. Burley, R. J. Karabinus, and R. J. Freedman. Aug 73, 49p NASA-TM-X-2854, E-7319

Descriptors: *Exhaust nozzles, *F-106 aircraft, *Flight tests, *Jet aircraft noise, *Static tests, Airspeed, Noise reduction.

For abstract, see STAR 1119

N73-28735/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLYOVER AND STATIC TESTS TO STUDY FLIGHT VELOCITY EFFECTS ON JET NOISE OF SUPPRESSED AND UNSUPPRESSED PLUG NOZZLE CONFIGURATIONS.
R. Chamberlin. Aug 73, 34p NASA-TM-X-2856, E-7186

Descriptors: *Jet aircraft noise, *Plug nozzles, *Static tests, Engine noise, Noise reduction, Plugging.

For abstract, see STAR 1119

N73-28738/5GA PC$4.00/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
AERODYNAMIC EFFECTS OF TIP CLEARANCE IN A LIFTING LINE IN A NON-UNIFORM FLOW.
Y. Sugiyama. Apr 73, 36p REPT-4/1973
Subm-Sponsored by Alexander-von-Humboldt Stift. Conf-Presented at the Gamm Meeting, Munich, Apr. 1973.

Descriptors: *Aerodynamic interference, *Axial flow turbines, *Blade tips, *Turbine blades, Channel flow, Drag, Lift, Nonuniform flow, Performance prediction, Small perturbation flow, Velocity distribution, Walls.

For abstract, see STAR 1119

N73-28918/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF AN ANNULAR COMBUSTOR DESIGNED FOR A LOW-COST TURBOJET ENGINE.
J. S. Fear. Aug 73, 43p NASA-TM-X-2857, E-7424

Descriptors: *Aircraft engines, *Combustion chambers, *Engine design, *Turbojet engines, Cost analysis, Product development, Systems analysis.

For abstract, see STAR 1119

21F. Nuclear Propulsion

N-73-12693/GA PC$5.45/MF$1.45
United Aircraft Corp., East Hartford, Conn. Research Labs.
NUCLEAR LIGHT BULB PROPELLANT HEATING SIMULATION USING A TUNGSTEN/ARGON AEROSOL AND RADIATION FROM A DC ARC SURROUNDED BY A SEGMENTED MIRROR CAVITY.
J. F. Klein. Sep 72, 57p NASA-CR-129499, L-910900-13
Contract SNPC-70

Descriptors: (*Light bulb reactors, *Radiant heat transfer), Aerosols, Argon compounds, Heating, High temperature, Performance, Simulation, Thermal radiation, Tungsten compounds.

For abstract, see NSA 28 03, number 07383.

N-73-12695/GA PC$4.00/MF$1.45
United Aircraft Corp., East Hartford, Conn. Research Labs.
CONCEPTUAL DESIGN STUDIES AND EXPERIMENTS RELATED TO CAVITY EXHAUST SYSTEMS FOR NUCLEAR LIGHT BULB CONFIGURATIONS.
J. S. Kendall, and R. C. Stoeffler. Sep 72, 33p
NASA-CR-129298, L-910900-15
Contract SNPC-70

Descriptors: (*Light bulb reactors, *Design), Hydrogen, Propulsion, Radiators, Thermal radiation.

For abstract, see NSA 28 03, number 07384.

N-73-12696/GA PC$5.45/MF$1.45
United Aircraft Corp., East Hartford, Conn. Research Labs.
ANALYTICAL DESIGN AND PERFORMANCE STUDIES OF THE NUCLEAR LIGHT BULB ENGINE.
R. J. Rodgers, and T. S. Latham. Sep 72, 73p
NASA-CR-129295, L-910900-16
Contract SNPC-70

Descriptors: (*Light bulb reactors, *Design), Analytical solution, Heat transfer, Performance, Reactor cooling systems.

For abstract, see NSA 28 03, number 07385.

N73-27575/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REACTOR MODERATOR, PRESSURE VESSEL, AND HEAT REJECTION SYSTEM OF AN OPEN-CYCLE GAS CORE NUCLEAR ROCKET CONCEPT.
M. F. Taylor, C. L. Whitmarsh, Jr., P. J. Sirocky, Jr., and L. C. Iwanczyke. Jul 73, 44p NASA-TM-X-2772, E-6588

Descriptors: *Nuclear rocket engines, *Reactor design, *Subassemblies, High temperature nuclear reactors, Reactor technology.

For abstract, see STAR 1118

N73-28175/0GA PC$3.00/MF$1.45
United Aircraft Corp., East Hartford, Conn.

EXPERIMENTAL AND ANALYTICAL STUDY OF ONEr AND TWO-COMPONENT FLOWS IN SPHERICAL CHAMBERS.
B. V. Johnson. Aug 73, 72p NASA-CR-2282, UARL-M910963-36
Contract NAS3-13446

Descriptors: *Flow visualization, *Nuclear rocket engines, *Reactor cores, Air, Flow chambers, Freon, Mass flow rate, Spheres, Transport properties, Water injection.

For abstract, see STAR 1119

21G. Reciprocating Engines

PATENT-3,744,510/GA Not available NTIS
Hughes Aircraft Co., Los Angeles, Calif.
INJECTOR FOR USE IN HIGH VOLTAGE ISOLATORS FOR LIQUID FEED LINES.
Patent.
J. A. Snyder. Patented 10 Jul 73, 4p NASA-CASE-NPO-11377,
Misc-Filed 7 Oct. 1971. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electric conductors, *Feed systems, *Fuel injection, *Injectors, Bubbles, Fluid flow, Fuel tanks, Patents, Porous materials.

An improved injector is described for use in introducing fluid substances into feed lines employed in delivering flowing bodies of liquids. The injector includes a porous plug, concentrically related to a feed line, including an internally tapered surface of a truncated conical configuration with an inlet orifice of a first diameter substantially smaller than the first diameter and an external surface circumscribed by an annular chamber containing a body of insulating gas.

21H. Rocket Motors and Engines

AD-767 628/1GA PC$2.75/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
THE SCOPE AND METHODS OF ENVIRONMENTAL TESTING OF DOUBLE-BASE PROPELLANT ROCKET MOTORS: CHOICE OF CONDITIONS AND INTERPRETATION OF RESULTS.
Technical note,
J. Gooding. Feb 73, 14p Rept no. ERDE-TN-86 DRIC-BR-35757

Descriptors: (*Rocket motors(Solid propellant), Environmental tests), Double base rocket propellants, Storage, Life expectancy, Aging(Materials), Cold weather tests, Desert tests, Great Britain.

Environmental testing problems are considered, primarily from the standpoint of the propellant chemist. Environments are defined and the significant aspects of motor design and possible failure modes considered. Preliminary tests, and environmental tests proper, which aim to simulate storage, transport and handling hazards in a realistic manner, are discussed, together with the size and scope of a test program. In conclusion the importance of surveillance is emphasised, in order that the results of these programs can be checked and adequate reasons established to account for any failures. (Author)

N73-27705/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LIQUID PROPELLANT GAS GENERATORS.
NASA Space Vehicle Design Criteria (Chemical Propulsion).
Mar 72, 110p NASA-SP-8081

Descriptors: *Engine design, *Exhaust gases, *Gas generators, *Gas turbines, *Systems engineering, Cooling systems, Performance tests, Prediction analysis techniques, Stress analysis, Thermal stresses.

For abstract, see STAR 1118

N73-27706/3GA PC$8.25/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
DEVELOPMENT OF A BIOWASTE RESISTOJET PROPULSION SYSTEM.
Final Report.
Jul 73, 122p NASA-CR-132269, MDC-G4745
Contract NAS1-10961

Descriptors: *Attitude control, *Metabolic wastes, *Resistojet engines, *Space stations, *Waste utilization, Equipment specifications, Propulsion system performance, Systems analysis.

For abstract, see STAR 1118

N73-27764/2GA PC$4.00/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
CONTINUED INVESTIGATION OF SOLID PROPULSION ECONOMICS. TASK 1B: LARGE SOLID ROCKET MOTOR CASE FABRICATION METHODS - SUPPLEMENT PROCESS COMPLEXITY FACTOR COST TECHNIQUE.
J. Baird. Aug 67, 38p NASA-CR-133412
Contracts NAS7-309, SRI PROJ. MU-5139

Descriptors: *Cost analysis, *Rocket engine cases, *Rocket engine design, *Solid propellant rocket engines, Equipment specifications, Fabrication, Manufacturing, Product development.

For abstract, see STAR 1118

PAT-APPL-370581/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ROCKET PROPELLANT INJECTION.
Patent Application.
G. A. Repas. Filed 15 Jun 73, 8p NASA-CASE-LEW-11071-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fuel injection, *Hydraulic equipment, *Liquid propellant rocket engines, Jet mixing flow, Patent applications, Porous plates, Sweat cooling.

A rocket propellant injector is provided in which all of the fuel flows through a porous faceplate for transpiration cooling. The oxidizer is swirled in tubular elements extending through the faceplate.

PATENT-3 726 480/GA Not available NTIS
Department of the Navy Washington D C
THRUST VECTORING CONTROL SYSTEM FOR ROCKET NOZZLES.
Patent,
Louis E. Miltenberger. Filed 24 Feb 71, patented 10 Apr 73, 7p Rept nos. PAT-APPL-118 540,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Thrust vector control systems, *Patents), (*Rocket motors, *Rocket motor nozzles), Convergent divergent nozzles, Variable area nozzles, Vernier rocket motors, Actuators, Flexible couplings.
Identifiers: PAT-CL-239-265-19.

The patent concerns a system for providing a rocket powered vehicle with complete thrust vectoring capabilities including a convergent-divergent nozzle attached to a motor casing by a flexible joint member. The flexible joint member includes a laminar structure comprising a series of alternate annular elastomeric and metallic shim members. The elastomeric shim members provide omnidirectional flexible capabilities for the nozzle. Integrally connected to the nozzle is a hydraulically controlled pintle member movable along the axis of the nozzle which varies the effective cross-sectional area of the throat of the nozzle and thereby varies the magnitude of the resulting thrust.

21I. Rocket Propellants

N73-27751/9GA PC$25.25/MF$1.45
Lockheed Missiles and Space Co., Palo Alto, Calif.
SHUTTLE CRYOGENIC SUPPLY SYSTEM OPTIMIZATION STUDY. VOLUME 2: TECHNICAL REPORT, SECTIONS 4 THROUGH 9.
Final Report, Oct. 1970 - Jun. 1973.
Jun 73, 464p NASA-CR-128993, LMSC-A991396-VOL-2
Contract NAS9-11330
Seri-11.

Descriptors: *Cryogenic rocket propellants, *Fuel systems, *Space shuttles, *Spacecraft components, Equipment specifications, Fluid flow, Systems engineering, Thermodynamic properties.

For abstract, see STAR 1118

N73-27752/7GA PC$17.50/MF$1.45
Lockheed Missiles and Space Co., Palo Alto, Calif.
SHUTTLE CRYOGENIC SUPPLY SYSTEM OPTIMIZATION STUDY. VOLUME 3: TECHNICAL REPORT, SECTION 10, 11 AND 12.
Final Report, Oct. 1970 - Jun. 1973.
30 Jun 73, 310p NASA-CR-128994, LMSC-A991396-VOL-3
Contract NAS9-11330
Seri-11.

Descriptors: *Cryogenic fluid storage, *Cryogenic rocket propellants, *Space shuttles, *Spacecraft components, Equipment specifications, Performance prediction, Systems analysis.

For abstract, see STAR 1118

N73-27755/0GA PC$4.50/MF$1.45
Boeing Co., Houston, Tex.
THE ANALYSIS OF THE TRANSIENT PRESSURE RESPONSE OF THE SHUTTLE EPS-ECS CRYOGENIC TANKS WITH EXTERNAL PRESSURIZATION SYSTEMS.
Final Report.
J. E. Barton, and H. W. Patterson. 29 Jun 73, 48p NASA-CR-133962, D2-118463
Contract NAS9-12977

Descriptors: *Cryogenic fluid storage, *Pressure effects, *Pressure vessels, *Propellant tanks, Computer programs, Equipment specifications, Numerical analysis, Systems analysis.

For abstract, see STAR 1118

N73-27756/8GA PC$5.75/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
SHUTTLE CRYOGENIC SUPPLY SYSTEM OPTIMIZATION STUDY. VOLUME 1: MANAGEMENT SUPPLY, SECTIONS 1 - 3.
Final Report, Oct. 1970 - Jun. 1973.
30 Jun 73, 74p NASA-CR-128992, LMSC-A991396-VOL-1
Contract NAS9-11330

Descriptors: *Cryogenic fluids, *Cryogenic storage, *Fuel systems, *Space shuttles, *Spacecraft components, Equipment specifications, Fluid flow, Systems engineering, Thermodynamic properties.

For abstract, see STAR 1118

N73-27757/6GA PC$12.75/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
SHUTTLE CRYOGENIC SUPPLY SYSTEM OPTIMIZATION STUDY. VOLUME 5A-1: USERS MANUAL FOR MATH MODELS.
Final Report, Oct. 1970 - Jun. 1973.
30 Jun 73, 212p NASA-CR-133953, LMSC-A991396-VOL-5A-1
Contract NAS9-11330

Descriptors: *Cryogenic fluid storage, *Fuel systems, *Space shuttles, *Spacecraft components, Computer programs, Fluid flow, Numerical analysis, Optimization, Thermodynamic properties.

For abstract, see STAR 1118

N73-27758/4GA PC$7.25/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
SHUTTLE CRYOGENIC SUPPLY SYSTEM OPTIMIZATION STUDY. VOLUME 5A-2: USERS MANUAL FOR SPACE SHUTTLE ORBIT INJECTION SYSTEM ANALYSIS (SOPSA).
Final Report, Oct. 1970 - Jun. 1973.
30 Jun 73, 103p NASA-CR-133954, LMSC-A991396-VOL-5A-2
Contract NAS9-11330

Descriptors: *Fuel systems, *Propellant transfer, *Propulsion system configurations, *Space shuttle orbiters, Computer programs, Numerical analysis, Spacecraft components, Systems engineering.

For abstract, see STAR 1118

N73-28500/9GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
DEVELOPMENT OF ISOTHERMAL RIGS.
Final Report.
R. A. Kaminskas, and D. J. Malone. 9 Apr 73, 49p NASA-CR-124314
Contract NAS8-28574

Descriptors: *Liquid rocket propellants, *Resonant frequencies, Acceleration (Physics), Cryogenics, Measuring instruments, Storage tanks, Weightlessness.

For abstract, see STAR 1119

N73-28737/7GA PC$8.50/MF$1.45
Rocketdyne, Canoga Park, Calif.
REGENERATIVELY COOLED ROCKET ENGINE FOR SPACE STORABLE PROPELLANTS.
Final Report, 1 May - 30 Dec. 1972.
W. R. Wagner. Jul 73, 126p NASA-CR-133488, R-9275
Contract NAS7-765

Descriptors: *Propellant storage, *Regenerative cooling, *Rocket engines, Combustion chambers, Engine design, Engine tests, Specifications.

For abstract, see STAR 1119

N73-28868/0GA PC$10.50/MF$1.45
Martin Marietta Corp., Denver, Colo.
COMPOSITE PROPULSION FEEDLINES FOR CRYOGENIC SPACE VEHICLES, VOLUME 1.
Final Report, Jun. 1970 - Dec. 1972.
C. A. Hall, D. J. Laintz, and J. M. Phillips. Aug 73, 168p NASA-CR-121137-VOL-1
Contract NAS3-14370

Descriptors: *Composite materials, *Cryogenic rocket propellants, *Pipes (Tubes), *Propellant transfer, Bonding, Linings, Performance tests, Spacecraft propulsion, Thermodynamic properties.

For abstract, see STAR 1119

N73-28869/8GA PC$11.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
COMPOSITE PROPULSION FEEDLINES FOR CRYOGENIC SPACE VEHICLES, VOLUME 2: APPENDICES.
Final Report, Jun. 1970 - Dec. 1972.
C. A. Hall, D. J. Laintz, and J. M. Phillips. Aug 73, 176p NASA-CR-121137-VOL-2
Contract NAS3-14370

Descriptors: *Composite materials, *Cryogenic rocket propellants, *Pipes (Tubes), *Propellant transfer, Bonding, Linings, Performance tests, Spacecraft propulsion, Thermodynamic properties.

For abstract, see STAR 1119

22. SPACE TECHNOLOGY

22A. Astronautics

N73-27737/8GA PC$3.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
SITE ALTERATION EFFECTS FROM ROCKET EXHAUST IMPINGMENT DURING A SIMULATED VIKING MARS LANDING. PART 1: NOZZLE DEVELOPMENT AND PHYSICAL SITE ALTERNATION.
G. L. Romine, T. D. Reisert, and J. Gliozzi. Jul 73, 169p NASA-CR-2252
Contract NAS1-9000

Descriptors: *Exhaust gases, *Jet impingement, *Propulsion system configurations, *Rocket exhaust, *Viking 75 entry vehicle, Landing sites, Mars landing, Mars surface, Soft landing.

For abstract, see STAR 1118

N73-27760/0GA PC$15.75/MF$1.45
Teledyne Brown Engineering, Huntsville, Ala.
SKYLAB EXPERIMENT PERFORMANCE EVALUATION MANUAL. APPENDIX T: EXPERIMENT T027/S073 CONTAMINATION MEASUREMENT, PHOTOMETER AND GEGENSCHEIN/ZODIACAL LIGHT (MSFC).
J. E. Meyers. Jul 73, 275p NASA-CR-61386
Contract NAS8-21804

Descriptors: *Gegenschein, *Photometers, *Skylab program, *Space missions, *Test facilities, Data acquisition, Data processing, Equipment specifications, Test equipment.

For abstract, see STAR 1118

N73-28020/8GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
PREFLIGHT SL-1/SL-3 SKYLAB VHF RANGING COVERAGE (NOMINAL TPI). ANTENNA AND PROPAGATION STUDIES FOR SPACECRAFT SYSTEMS, TASK E-531.
D. R. Eisenhauer, and D. A. James. 13 Jul 73, 47p NASA-CR-133981, TRW-20029-H203-R0-00
Contract NAS9-12330

Descriptors: *Rangefinding, *Rendezvous guidance, *Skylab program, *Very high frequencies, Antenna design, Directional antennas, Mission planning, Saturn workshops.

For abstract, see STAR 1119

N73-28556/1GA PC$4.25/MF$1.45
Rensselaer Polytechnic Inst., Troy, N.Y. School of Engineering.
STOCHASTIC ESTIMATES OF GRADIENT FROM LASER MEASUREMENTS FOR AN AUTONOMOUS MARTIAN ROVING VEHICLE.
P. A. Burger. May 73, 41p NASA-CR-133498, RPI-TR-MP-33
Contract NGL-33-018-091

Descriptors: *Lasers, *Mars surface, *Roving vehicles, *Slopes, *Terrain, Data processing, Errors, Gradients, Surface roughness.

For abstract, see STAR 1119

N73-28841/7GA PC$5.50/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
CURRENT ACHIEVEMENTS IN ASTRONAUTICS.
A. Vinogradov, and Y. Surkov. Aug 73, 69p NASA-TT-F-14929
Contract NASW-2482
Tran-Transl. Into English of the Publ. "Sovremenniye Dostizheniya Kosmonavtiki" Moscow, Zhaniye, 1972 48 p.

Descriptors: *Lunar topography, *Satellite transmission, *Space stations, *U.s.s.r. space program, Mars surface, Research and development, Venus (Planet).

For abstract, see STAR 1119

N73-28844/1GA PC$7.25/MF$1.45
Colorado Univ., Boulder. Dept. of Astro-Geophysics.
OUTER PLANETS GRAND TOURS: PLANETARY RADIO ASTRONOMY TEAM REPORT.
J. W. Warwick. 1 Feb 72, 101p NASA-CR-133500
Contract NGR-06-003-185

Descriptors: *Extrasolar planets, *Outer planets explorers, *Radio emission, *Short wave radiation, Experimentation, Grand tours, Radio astronomy, Satellite-borne instruments.

For abstract, see STAR 1119

N73-28852/4GA PC$5.75/MF$1.45
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
CONVECTION IN SKYLAB M512 EXPERIMENTS M551, M552, AND M553. PHASE B REPORT.
Phase B Report, period ending 15 Jul. 1973.
S. V. Bourgeois, Jr.. Jul 73, 75p NASA-CR-124329, LMSC/HREC-TR-D306697
Contract NAS8-27015

Descriptors: *Convection, *Experimental design, *Liquid metals, *Skylab program, *Solidification, Liquid flow, Reduced gravity.

For abstract, see STAR 1119

22B. Spacecraft

AD-767 588/7GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
EXPERIMENTS IN SMALL ROCKET DEPLOYMENT OF 1000-FOOT-LONG ELECTRICALLY CONDUCTING FILAMENTS.
Instrumentation papers,
Charles B. Kalakowsky, Roger W. Whidden, and Edward A. Lewis. 10 Jul 73, 18p Rept nos. AFCRL-TR-73-0408, AFCRL-IP-194

Descriptors: (*Lightning, Ground(Electrical)), (*Launch vehicles(Aerospace), Hazards), Tape wound construction, Electrical conductance, Tapes, Metal coatings, Manufacturing methods, Folding fins(Rockets).
Identifiers: Polyethylene terephthalate, Polumeric films, *Lightning hazards.

A method of rapidly deploying long, electrically conducting filaments of metallized mylar in the air at selected altitudes was designed and tested to a limited extent. The mylar, specially wound in tight rolls, is loaded into small rocket pods and pyrotechnically ejected at predetermined altitudes. Aerodynamic forces decelerate the rolls and cauuse them to unfurl rapidly. The technique

is intended for use in evaluating and possibly reducing lightning hazards to aerospace vehicles. (Author)

N73-27177/7GA PC$11.75/MF$1.45
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
DEVELOPMENT OF SIMULATION COMPUTER COMPLEX SPECIFICATION.
Final Report.
29 Jun 73, 195p NASA-CR-133965, MDC-E0857
Contract NAS9-12882

Descriptors: *Space shuttles, *Spacecraft cabin simulators, *Spacecrews, *Training simulators, Computer programs, Data processing equipment, Equipment specifications, Procurement management.

For abstract, see STAR 1118

N73-27753/5GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FLIGHT TEST RESULTS FROM THE CV990 SIMULATED SPACE SHUTTLE DURING UNPOWERED AUTOMATIC APPROACHES AND LANDINGS.
F. G. Edwards, and J. D. Foster. Aug 73, 43p
NASA-TM-X-62285

Descriptors: *Space shuttles, *Spacecraft control, *Spacecraft landing, *Spacecraft performance, Area navigation, Flight safety, Flight simulation, Terminal facilities.

For abstract, see STAR 1118

N73-27761/8GA PC$3.25/MF$1.45
Wisconsin Univ., Madison. Space Science and Engineering Center.
STUDIES OF SOUNDINGS AND IMAGINGS MEASUREMENTS FROM GEOSTATIONARY SATELLITES.
Quarterly Report, 1 Feb. - 30 Apr. 1973.
V. E. Suomi. May 73, 24p NASA-CR-132799, QR-3
Contract NAS5-21798

Descriptors: *Artificial satellites, *Satellite attitude control, *Satellite observation, *Satellite perturbation, Clouds (Meteorology), Data acquisition, Data transmission, Meteorological parameters.

For abstract, see STAR 1118

N73-27816/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SIGNIFICANT ACCOMPLISHMENTS IN TECHNOLOGY, 1972.
1973, 186p NASA-SP-326, LC-73-600090
Conf-Symp. Held at Greenbelt, MD., 7-8 Nov. 1972.

Descriptors: *Conferences, *Ground based control, *Sensors, *Spacecraft communication, *Spacecraft guidance, *Technology utilization, Astroguide navigation system, Attitude stability, Computer techniques, Satellite transmission, Spaceborne telescopes.

For abstract, see STAR 1118

N73-28847/4GA PC$15.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
MISSION REQUIREMENTS FOR A MANNED EARTH OBSERVATORY. TASK 2: REFERENCE MISSION DEFINITION AND ANALYISS, VOLUME 2.
31 May 73, 269p NASA-CR-124340, TRW-21324-6002-RU-00-VOL-2
Contract NAS8-28013
Seri-4.

Descriptors: *Manned orbital research laboratories, *Mission planning, *Research facilities, *Space missions, Payloads, Remote sensors, Spacecraft configurations, Spacecraft design.

For abstract, see STAR 1119

N73-28848/2GA PC$17.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
MISSION REQUIREMENTS FOR A MANNED EARTH OBSERVATORY. TASK 3: CONCEPTUAL DESIGN, VOLUME 3.
31 May 73, 315p NASA-CR-124338, TRW-21324-6003-RU-00-VOL-3
Contract NAS8-28013
Seri-4.

Descriptors: *Manned orbital research laboratories, *Mission planning, *Research facilities, *Space missions, Equipment specifications, Remote sensors, Spacecraft components, Spacecraft design.

For abstract, see STAR 1119

N73-28849/0GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
MISSION REQUIREMENTS FOR A MANNED EARTH OBSERVATORY. TASK 4 PROGRAMMATICS, VOLUME 4.
31 May 73, 48p NASA-CR-124339, TRW-21324-6004-RU-00-VOL-4
Contract NAS8-28013
Seri-4.

Descriptors: *Manned orbital research laboratories, *Mission planning, *Research facilities, *Space missions, Payloads, Remote sensors, Spacecraft configurations, Spacecraft design.

For abstract, see STAR 1119

N73-28860/7GA PC$3.25/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 1: EXECUTIVE SUMMARY REPORT.
Jun 73, 25p NASA-CR-133968, SD-73-SA-0036-1
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Electromagnetic interference, Orbital mechanics, Space transportation, Spacecraft communication, Technological forecasting.

For abstract, see STAR 1119

N73-28861/5GA PC$9.00/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 2: OVERALL STUDY SUMMARY.
Jun 73, 136p NASA-CR-133969, SD-73-SA-0036-2
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Electromagnetic interference, Orbital mechanics, Space transportation, Spacecraft communication, Technological forecasting.

For abstract, see STAR 1119

N73-28862/3GA PC$12.50/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 3: GEOSYNCHRONOUS MISSION CHARACTERISTICS.
Jun 73, 209p NASA-CR-133970, SD-73-SA-0036-3
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Atmospheric windows, Mission planning, Orbital mechanics, Radio frequencies, Spacecraft communication, Trajectory analysis.

For abstract, see STAR 1119

N73-28863/1GA PC$10.00/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 4, PART 1: TRAFFIC ANALYSIS AND SYSTEM REQUIREMENTS FOR THE BASELINE TRAFFIC MODEL.
Jun 73, 157p NASA-CR-133971, SD-73-SA-0036-4-VOL-4-PT-1
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Electromagnetic interference, Mathematical models, Mission planning, Orbital mechanics, Spacecraft communication, Traffic control.

For abstract, see STAR 1119

N73-28864/9GA PC$11.50/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 4, PART 2: TRAFFIC ANALYSIS AND SYSTEM REQUIREMENTS FOR THE NEW TRAFFIC MODEL.
Jun 73, 190p NASA-CR-133972, SD-73-SA-0036-4-VOL-4-PT-2
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Mathematical models, Mission planning, Orbital mechanics, Spacecraft communication, Technology assessment, Traffic control.

For abstract, see STAR 1119

N73-28865/6GA PC$18.00/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 5: GEOSYNCHRONOUS PLATFORM SYNTHESIS.
Jun 73, 317p NASA-CR-133973, SD-73-SA-0036-5
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Space maintenance, Spacecraft electronic equipment, Spacecraft modules, Spacecraft power supplies, Tdr satellites.

For abstract, see STAR 1119

N73-28866/4GA PC$8.50/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.
GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 6: GEOSYNCHRONOUS PROGRAM EVALUATION AND RECOMMENDATIONS.
H. L. Myers. Jun 73, 127p NASA-CR-133974, SD-73-SA-0036-6-VOL-6
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Cost analysis, Data bases, Mission planning, Space logistics, Space shuttles, Space transportation, Space tugs.

For abstract, see STAR 1119

N73-28867/2GA PC$9.75/MF$1.45
Rockwell International Corp., Downey, Calif. Space Div.

GEOSYNCHRONOUS PLATFORM DEFINITION STUDY. VOLUME 7: GEOSYNCHRONOUS TRANSPORATION REQUIREMENTS.
H. L. Myers. Jun 73, 151p NASA-CR-133975, SD-73-SA-0036-7-VOL-7
Contract NAS9-12909

Descriptors: *Space programs, *Stabilized platforms, *Synchronous satellites, *Systems engineering, Solar electric propulsion, Space maintenance, Space shuttles, Space transportation, Space tugs, Spacecraft docking.

For abstract, see STAR 1119

N73-28870/6GA PC$14.25/MF$1.45
Vought Aeronautics, Dallas, Tex.
A LOW SPEED WIND TUNNEL TEST OF THE 0.050 SCALE NASA-JSC SHUTTLE ORBITER 089B TO DETERMINE THE LONGITUDINAL AND LATERAL DIRECTIONAL EFFECTS OF CONTROL SURFACE MODIFICATIONS.
Test Report, 24 Apr. - 2 May 1973.
R. H. Oldenbuttel. 8 Jun 73, 244p NASA-CR-133979, LSWT-422
Contract NAS9-12731

Descriptors: *Aerodynamic characteristics, *Control surfaces, *Space shuttle orbiters, *Wind tunnel stability tests, Spacecraft configurations, Spacecraft control, Spacecraft stability.

For abstract, see STAR 1119

PAT-APPL-384773/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ANNULAR MOMENTUM CONTROL DEVICE USED FOR STABILIZATION OF SPACE VEHICLES AND THE LIKE.
Patent Application.
W. W. Anderson, and N. J. Groom. Filed 1 Aug 73, 11p NASA-CASE-LAR-11051-1, Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Rotating bodies, *Spacecraft stability, *Systems stability, Mechanical devices, Mechanical drives, Moments of inertia, Patent applications.

An annular momentum control device used for stabilization of space vehicles is described. The device provides spacecraft stability about two axes. The body of the space vehicle is mounted coaxially with the axis of rotation of an annular-shaped inertial mass. A linear induction motor drives the inertial mass. The body is located within the annulus which provides a topological advantage and permits the increase of the radial dimension of the stabilizing mass which results in the generation of a greater stabilizing force than in vehicles having different body-stabilizing mass configurations.

22C. Spacecraft Trajectories and Reentry

N73-27620/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
BOUNDARY-LAYER ELECTRON PROFILES FOR ENTRY OF A BLUNTS SLENDER BODY AT HIGH ALTITUDE.
J. S. Evans, C. J. Schexnayder, Jr., and P. W. Huber. Jul 73, 40p NASA-TN-D-7332

Descriptors: *Blunt bodies, *Boundary layers, *Electron density (Concentration), *Reentry, Earth atmosphere, Electrostatic probes, Flow distribution.

For abstract, see STAR 1118

N73-27732/9GA PC$12.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NSSDC INDEX OF INTERNATIONAL SCIENTIFIC ROCKET LAUNCHES ORDERED BY SPONSERING COUNTRY/AGENCY.
Feb 72, 214p NASA-TM-X-69350, NSSDC-72-05

Descriptors: *Indexes (Documentation), *International cooperation, *Rocket launching, *Science, Astronomy, Meteorology, Sounding rockets.

For abstract, see STAR 1118

N73-27734/5GA PC$5.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GPS EARLY-ORBIT SUBSYSTEM FOR EARTH SATELLITES.
V. T. Laczo, and J. L. Maury. Dec 72, 65p NASA-TM-X-66286, X-552-72-502

Descriptors: *Earth satellites, *Orbital mechanics, *Trajectory analysis, Gauss equation, Geodetic coordinates, Range and range rate tracking, State vectors.

For abstract, see STAR 1118

N73-27738/6GA PC$3.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
APPLICATION OF MATCHED ASYMPTOTIC EXPANSIONS TO LUNAR AND INTERPLANETARY TRAJECTORIES. VOLUME 1: TECHNICAL DISCUSSION.
J. E. Lancaster. Jul 73, 110p NASA-CR-2255, MDC-G2748-VOL-1
Contract NAS9-10526

Descriptors: *Asymptotic methods, *Interplanetary trajectories, *Lunar trajectories, Boundary value problems, Celestial mechanics, Many body problem, Numerical analysis.

For abstract, see STAR 1118

N73-27750/1GA PC$4.25/MF$1.45
Radio and Space Research Station, Slough (England).
CATALOGUE OF ROCKET AND SATELLITE DATA, ISSUE NO. 1, 1972.
1972, 44p

Descriptors: *Catalogs (Publications), *International cooperation, *Rocket launching, Atmospheric physics, Satellite observation, Solar physics.

For abstract, see STAR 1118

N73-27763/4GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A SEMI-ANALYTICAL METHOD OF COMPUTATION OF OCEANIC TIDAL PERTURBATIONS IN THE MOTION OF ARTIFICIAL SATELLITES.
P. Musen. Jul 73, 23p NASA-TM-X-66298, X-590-73-190

Descriptors: *Artificial satellites, *Ocean currents, *Spacecraft motion, *Tides, Celestial mechanics, Fourier series, Perturbation theory.

For abstract, see STAR 1118

N73-28845/8GA PC$3.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
APPLICATION OF MATCHED ASYMPTOTIC EXPANSIONS TO LUNAR AND INTERPLANETARY TRAJECTORIES. VOLUME 2: DERIVATIONS OF SECOND-ORDER ASYMPTOTIC BOUNDARY VALUE SOLUTIONS.
J. E. Lancaster. Jul 73, 191p NASA-CR-2256, MDC-G2748-VOL-2
Contract NAS9-10526

Descriptors: *Asymptotic methods, *Boundary value problems, *Interplanetary trajectories, *Lunar trajectories, *Many body problem, Differential equations, Equations of motion, Numerical analysis, Trajectory analysis.

For abstract, see STAR 1119

N73-28846/6GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE BMW ANALYTIC AERODYNAMIC DRAG METHOD FOR THE VINTI SATELLITE THEORY.
J. S. Watson, G. D. Mistretta, and N. L. Bonavito. Dec 72, 53p NASA-TM-X-70418, X-591-72-499

Descriptors: *Equations of motion, *Satellite orbits, *Vinti theory, Aerodynamic drag, Ellipsoids, Geodesy, Position (Location), Velocity.

For abstract, see STAR 1119

N73-28855/7GA PC$3.25/MF$1.45
Analytical Mechanics Associates, Inc., Seabrook, Md.
TWO IMPULSE TRAJECTORY OPTIMIZATION FOR THE RAE-B ORBIT TRIM PROBLEM.
M. H. Payne, S. Pines, and J. L. Horsewood. May 72, 22p 0NASA-CR-130226, 0REPT-72-23
Contract 0NAS5-119000

Descriptors: *Trajectory optimization, *Transfer orbits, Computer programs, Lunar orbits, Problem solving, Time functions.

For abstract, see STAR 1119

REPORT LOCATOR LIST

This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 73, Number 22.**

18J AAEC/E-227/GA
18K AAEC/E-254/GA
18I AAEC/LIB/Bib-376/GA
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07D CONF-730616-1/GA
18B CONF-730618-2/GA
06R COO-1024-48/GA
07D COO-1082-39/GA
20H COO-1428-319/GA
09B COO-1469-218/GA
12A COO-1469-220/GA
12A COO-1469-221/GA
09B COO-1469-222/GA
08M COO-1495-22/GA
20H COO-1505-59/GA
07D COO-1515-38/GA
07D COO-1515-42/GA
07D COO-1515-46/GA
07D COO-1515-47/GA
20H COO-1545-117/GA
20H COO-1545-122/GA
06R COO-1602-34/GA

06P COO-1602-35/GA
07E COO-1617-36/GA
06M COO-1633-24/GA
07D COO-1680-18/GA
07D COO-1680-19/GA
11F COO-1791-4/GA
07D COO-2092-22/GA
06A COO-2101-13/GA
06A COO-2101-14/GA
20L COO-2103-25/GA
06F COO-2111-3/GA
13B COO-2158-7/GA
20H COO-2171-15/GA
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20H COO-2231-11/GA
20I COO-2233-2/GA
04A COO-2249-2/GA
18K COO-2250-1/GA
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06E COO-2269-2/GA
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20H COO-2271-10/GA
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20J COO-2271-6/GA
20J COO-2271-7/GA
20H COO-2271-8/GA
20H COO-2271-9/GA
20H COO-3001-34/GA
20H COO-3001-35/GA
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06C COO-3007-24/GA
07E COO-3007-25/GA
06C COO-3016-1/GA
07D COO-3027-6/GA
07D COO-3028-3/GA
08H COO-3062-13/GA
06R COO-3086-2/GA
06R COO-3095-10/GA
06C COO-3115-6/GA
09A COO-3120-3-A/GA
06A COO-3120-4/GA
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09B COO-3130-TB-167/GA
20H COO-3130-TB-174/GA
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06P COO-3139-7/GA
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20L COO-3156-56/GA
20L COO-3158-15/GA
11F COO-3166-3/GA
11F COO-3166-5/GA
11F COO-3171-13/GA
02D COO-3217-18/GA
06F COO-3222-3/GA
06R COO-3264-7/GA
06R COO-3264-8/GA
20L COO-3311-11/GA
18D COO-3333-3/GA
06R COO-3334-2/GA
06F COO-3390-7/GA
06R COO-3419-6/GA
11B COO-3420-2/GA
06M COO-3516-2/GA
18D COO-3545-1/GA
06A COO-875-155/GA
20H COO-881-380/GA
02E COO-910-29/GA
09B CTC-INF-1046/GA
18C D-754087/GA
20H DESY-73/5/GA
18D DESY-73/7/GA
20H DESY-73/8/GA
18E DLCS-5000472/GA
18H DOCKET-408027-10/GA
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18E DOCKET-50424-12/GA
18E DOCKET-50424-14/GA
18J DOCKET-701292-5/GA
18H DOCKET-701372-2/GA
18J DP-Report-610(Pt.1)/GA
18J DP-Report-614/GA
18I DP-Report-622/GA
18I DP-Report-639/GA
18I DP-Report-645/GA
18J DP-Report-646/GA
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18J DP-Report-673/GA
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18I DP-Report-690/GA
18J DP-Report-699/GA
18I DPSPU-72-30-9/GA
09C DUN-SA-200/GA
18I DUN-8028-B/GA
18I DUN-8043/GA
18J DUN-8056(Rev.1)/GA
13H DUN-8097/GA
13I DUN-8099/GA
18I DUN-8131/GA
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06F EDFB-IBP-73-2/GA
20H EIR-232/GA
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13B EIS-AA-73-1571-F/GA
13B EIS-AA-73-1586-D/GA
13B EIS-CA-73-1559-D/GA
13B EIS-CA-73-1579-D/GA
13B EIS-CO-73-1542-D/GA
13B EIS-CO-73-1568-D/GA
13B EIS-DC-73-1567-F/GA
13B EIS-DE-73-1572-D/GA
13B EIS-FL-73-1543-D/GA
13B EIS-FL-73-1549-D/GA
13B EIS-FL-73-1551-D/GA
13B EIS-FL-73-1578-D/GA
13B EIS-HI-73-1570-D/GA
13B EIS-IA-73-1548-D/GA
13B EIS-KS-73-1560-F/GA
13B EIS-KY-73-1550-D/GA
13B EIS-KY-73-1583-F/GA
13B EIS-LA-73-1564-F/GA
13B EIS-MN-73-1533-F/GA
13B EIS-MO-73-1552-F-1/GA
13B EIS-MO-73-1552-F-2/GA
13B EIS-MO-73-1552-F-3/GA
13B EIS-MO-73-1552-F-4/GA
13B EIS-MT-73-1537-D/GA
13B EIS-MT-73-1576-F/GA
13B EIS-NC-73-1590-F/GA
13B EIS-NM-73-1516-F/GA
13B EIS-OK-73-1557-F/GA
13B EIS-OR-73-1547-F/GA
13B EIS-OR-73-1569-D/GA
13B EIS-SC-73-1574-D/GA
13B EIS-SC-73-1575-D/GA
13B EIS-SD-73-1539-D/GA
13B EIS-TN-73-1604-F/GA
13B EIS-TX-73-1562-D/GA
13B EIS-TX-73-1573-D/GA
13B EIS-UT-73-1584-D/GA
13B EIS-WA-73-1577-D/GA
13B ESTR-1-72/GA
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20I EUR-CEA-FC-679/GA
18J EUR-4772/GA
06P EUR-4864/GA
14B EUR-4886/GA
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12A EUR-4959/GA
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08F E73-10987/GA
08G E73-10992/GA
08F E73-11005/GA
08H E73-11007/GA
02F E73-11017/GA
08G E73-11020/GA
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18K FEI-361/GA
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11F FRNC-CONF-72/GA
07D FRNC-CONF-74/GA
11F FRNC-CONF-77/GA
18B FRNC-CONF-80/GA
11F FRNC-TH-279/GA
06R FRNC-TH-299/GA
07D FRNC-TH-314/GA
07D FRNC-TH-315/GA
06A FRNC-TH-322/GA
08G FRNC-TH-335/GA
20H FRNC-TH-339/GA
20H FRNC-TH-340/GA
20H FRNC-TH-355/GA
09A FRNC-TH-357/GA
07D GAT-T-2040/Ths/GA
13A GAT-Z-4128(Vol.2)/GA
18B GAT-675/GA
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18I GEAP-10763/GA
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20H ITF-72-162-E/GA
20J ITF-72-173-E/GA
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20J ITF-72-187-P/GA
20H ITF-72-190-P/GA
20H ITF-72-81-E/GA
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18N NAA-SR-9400(Vol.3)/GA
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18F ORNL-RSIC-31(Vol.1)/GA
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13B PB-223 949/9GA
13B PB-223 950/7GA
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